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AMERICAN
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DEVOTED TO TEXTILE WET-PROCESSING

contents

VOLUME 49 May 2, 1960 NUMBER 9

special article

An Approach to Automation of a Wrinkle Recovery Tester 25 (302)
Julia M Sloan, Chester H Haydel, E Fred Schultz Jr, and Heber W Weller Jr

aatcc proceedings

Twelve Million Yards of Natural and Man-made Fibers Dyed on the Swedish Pad-roll Dyeing Machine 29 (P306)
Robert M Lesh
Chemical Principles of Dyeing and Finishing 33 (P310)
Robert A Brooks
The Dyeing of Acrilan 16 and Acrilan 16/Acrilan Blends 37 (P314)
Thomas E Croxson
AATCC Deceased 41 (P318)
Activities of the Local Sections 41 (P318)
Elected to Membership 44 (P321)
AATCC Calendar 44 (P321)

departments

General Calendar 27 (304)
News of the Trade 46 (322)
Names in the News 48 (323)
New Products, Developments, Processes 52 (325)
Abstracts 60 (332)

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Contents of previous issues can be found by consulting the Service and Technology Index and the Engineering Index, at your Library

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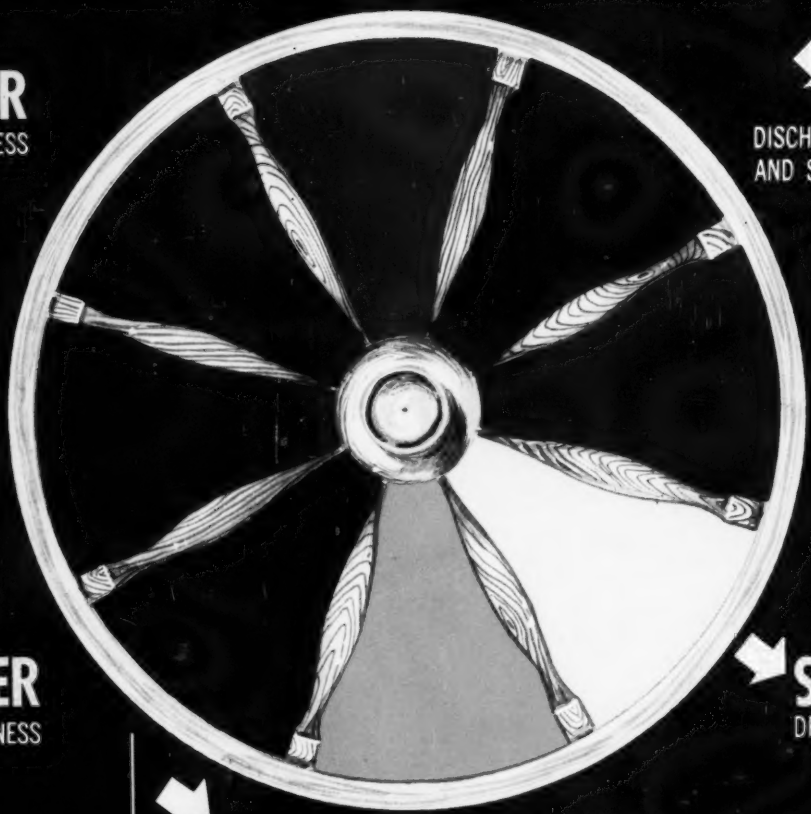

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AMERICAN

DYESTUFF REPORTER

Volume 49 May 2, 1960 No. 9

AN APPROACH TO AUTOMATION OF A WRINKLE RECOVERY TESTER

JULIA M SLOAN, CHESTER H HAYDEL, E FRED SCHULTZ JR, and HEBER W WELLER JR

Southern Regional Research Laboratory[1]
New Orleans, Louisiana

INTRODUCTION

THE development of "wash-wear" fabrics and products is probably the most important textile advancement for cotton of modern times. Not only has the consumer been given new satisfaction through novel qualities in cotton products, but cotton utilization has been appreciably stimulated.

Today, many extensive research programs are in progress for the purpose of developing new and more effective "wash-wear" treatments for cotton. They have been somewhat handicapped, however, by the need for better test methods for evaluating the "wash-wear" characteristics of the different treatments as applied to a wide range of fabric constructions.

Among laboratory tests, the manual measurement of the crease recovery angle stands out as the most useful quantitative criterion for evaluating wrinkle recovery—the property most closely related to the desired "wash-wear" characteristics. The test consists essentially of suspending a mounted specimen of the fabric, previously creased and compressed under controlled conditions, at the center of a vertically stationed protractor (Monsanto[2] or Shirley[2] wrinkle-resistance testers) so that one-half of the specimen is held firmly by the specimen holder while the other half is permitted to hang freely (*1, 2, 3, 4*). The freely hanging half of the specimen is kept aligned with a vertical guide line for the five-minute recovery period so as to avoid the effects of gravity during the test. Adjustments are made several times during the first minute and once a minute thereafter until the end of the period when the angle is measured (*1, 2*).

One technician often operates as many as six testers concurrently by staggering the cycles so that one set is being pressed while the other set is recovering. This technique, which requires the full attention of the technician, can become very fatiguing and could lead to reduced careful attention to detail and consequently less accuracy of results.

One can readily see that the development of an autmoatic tester would be a valuable contribution to the field of textile testing. It would provide continuous adjustments as needed, thus eliminating some of the human factors in the test. One technician could then make a greater number of recovery angle measurements concurrently and also be able to prepare specimens for subsequent measurements. The close attention required of the technician for accurate adjustments would be eliminated. Considerable time as well as monetary savings would be expected. Most important, the research program should be better served by anticipated prompter testing service and more objective measurements.

This paper describes the electronically operated mechanisms which have been employed in an initial approach toward the automation of a wrinkle recovery tester. It also reports data obtained with this automatic instrument in comparison with similar data obtained in the usual manner with the Monsanto Wrinkle Recovery Tester.

DESCRIPTION OF TESTER DEVELOPED

Figure 1 illustrates schematically the working model which has been developed. The principal components are a 4.5-inch-diameter plastic protractor (essentially the same as used on the Monsanto Wrinkle Recovery Tester), a 5.5-inch-diameter transparent plastic disc mounted with a sample holder, photoelectric cell with simple amplifier and relay circuit (diagramically shown in Figure 2), a light source, a small electric motor, and an electric timer.

The protractor is mounted in a stationary position on a plywood stand. Over it is mounted concentrically the larger diameter transparent plastic disc which is supported by three radial ball bearings and a 0.25-inch-diameter gear on the drive shaft of the motor[3]. The motor rotates this disc at the rate of 0.091 rpm through the contact of the supporting 0.25-inch-diameter gear with the outer periphery of the disc. The coil spring attached to the motor supplies the necessary tension to maintain the motor gear against the outer periphery of the plastic disc and also acts as a slip clutch during zeroing of the tester.

A picture of the model is shown in Figure 3. It indicates substantially how the tester functions automatically through the use of a photoelectric cell as a sensing device. The path of the collimated light beam (3/32 inches wide) from the light source to the photoelectric cell is in the same vertical plane as the guide line on the fixed protractor. Only a rectangular slit (⅝ inch × 3/32 inch) of the glass

[1]One of the laboratories of the Southern Utilization Research and Development Division, Agricultural Research Service, U S Department of Agriculture.

[2]Trade names are given as part of the exact experimental conditions and not as an endorsement of the product over those of other manufacturers.

[3]Synchron (two rpm), manufactured by Hanson Manufacturing Co, Princeton, Ind.

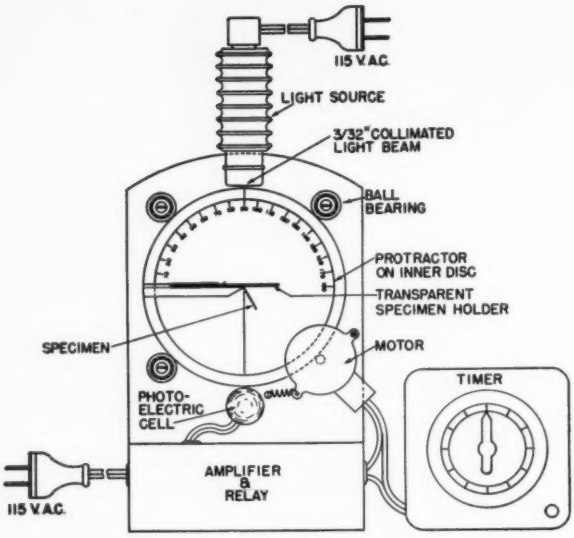

Figure 1
Schematic diagram of automatic testers

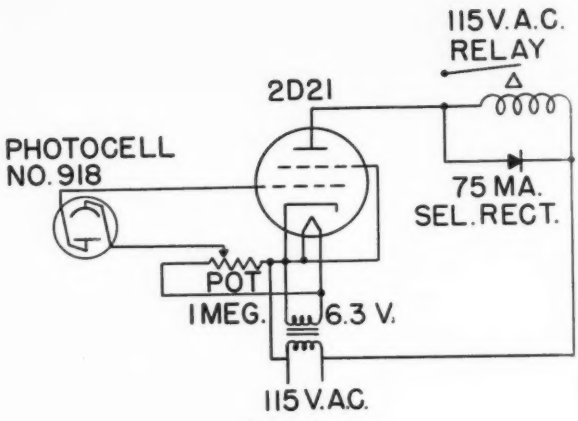

Figure 2
Circuit diagram

surface of the photoelectric cell is exposed to the light beam. The rest of the surface is covered with black paint.

The electric circuit is arranged so that as long as the light beam is not broken the motor is not in operation. As the recovery angle of the specimen of fabric increases, the dangling end of the specimen moves out to the right of the vertical beam of light. This blocking of the light beam deactivates the photoelectric cell which operates through the relay to start the motor. The outer disc is then rotated until the dangling end of the specimen is brought back into vertical alignment. Once in this position the light beam makes contact again with the photoelectric cell. This stops the motor. This sequence of operations is repeated whenever the free end of the specimen blocks the light beam. At the end of the five-minute test period, the timer shuts off the current to the tester and the wrinkle recovery angle is read from the protractor immediately or at the convenience of the technician.

SAMPLES AND EXPERIMENTAL PROCEDURE

Seven fabrics were evaluated by both the automatic tester and the Monsanto Wrinkle Recovery Tester in order to test the feasibility of this approach to automation. Fabrics numbered 1 through 5 were scoured and bleached 80×80 cotton print cloths, weighing 3.2 ounces per square yard. Each had been given a different "wash-wear" resin treatment.

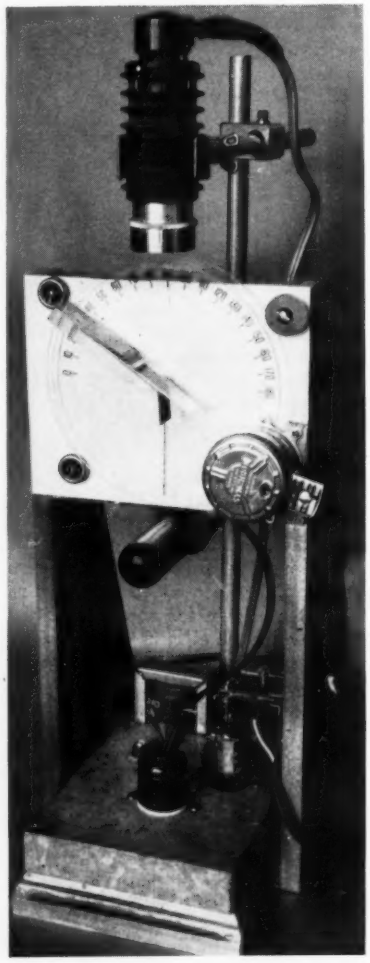

Figure 3
Photograph of working model of automatic tester

Fabric No. 6 was a cotton twill weighing 7.8 ounces per square yard which had received a "wash-wear" resin treatment, while fabric No. 7 was the same twill untreated.

A set of fixed-angle metal specimens corresponding in size to the cloth specimens was prepared to check the accuracy and reproducibility of the automatic tester. The angles measured 90, 120, 135, and 150 degrees.

Four technicians participated in these tests. Operator 1 (who had assembled the automatic tester) had no previous experience in measuring crease recovery while the other three were experienced operators. When using the Monsanto testers, each operator tested six specimens of the same fabric to determine the variability of the procedure. The metal specimens with fixed angles were tested on the automatic tester by only one operator.

RESULTS AND DISCUSSION

Table I shows the average angles obtained on the fabrics by two operators using the automatic tester and by three operators using the conventional Monsanto testers. Also shown in the table are the standard deviations of specimens of the same fabric and the repeated measurements of the fixed-angle metal specimens.

The mean squares of the several sources of variability affecting the comparison of manual and automatic testers are given in Table II.

In twelve repetitions for each of the four fixed angles (total of 48 measurements), the correct values were reproduced with an overall standard deviation of 1.3°. This variability is appreciably less than was found for any fabric, regardless of tester or operator.

TABLE I

Summary of average angles of recovery and standard deviations obtained with the automatic and Monsanto Wrinkle Recovery Testers

Fabric no. and direction	Number of specimens	Average crease recovery angle (degrees) — Automatic Tester — Operator 1	Automatic Tester — Operator 2	Manual tester — Operator 2	Manual tester — Operator 3	Manual tester — Operator 4
No 1, Warp	18	140.3	140.8	140.3	141.6	144.9
No 2, Warp	18	141.9	142.4	141.3	140.6	139.9
No 3, Warp	18	149.4	149.4	149.0	145.0	144.2
No 4, Warp	6	148.0	—	148.3	143.2	149.2
No 4, Filling	6	147.0	—	147.0	148.2	149.0
No 5, Warp	6	135.0	—	135.3	140.5	133.3
No 5, Filling	6	134.2	—	134.3	138.7	137.8
No 6, Warp	6	140.5	—	141.0	144.2	134.3
No 6, Filling	6	114.5	—	114.3	124.5	121.8
No 7, Warp	6	93.3	—	93.5	91.0	86.5
No 7, Filling	6	84.7	—	84.7	86.7	78.3
Average (102 specimens)		134.8	—	134.7	135.2	134.0
STANDARD DEVIATION OF DETERMINATION (DEGREES)						
First three fabrics	54	3.0	2.7	2.8	3.5	3.2
All fabrics	102	4.4	—	4.2	3.8	3.6
Fixed metal angles	48	1.3	—	—	—	—

TABLE II

Pooled estimates of variation from analyses of the three groups of fabrics

Source of variation	Degrees of freedom	Mean square
Testing methods (auto vs manual)	3	40.8
Manual testers	6	71.0
Testing methods x fabrics	8	60.1
Manual testers x fabrics	16	88.8
Determinations of a tester on a single fabric	415	15.0

The averages in Table I and the mean squares in Table II reveal no large or consistent differences between angles obtained with the automatic and manual testers. The standard deviations in Table I indicate that the variability among multiple specimens of the same fabric is essentially the same for the automatic as for the manual tester. Comparison of the mean square for "Manual testers × fabrics" (88.8) with that for "Determinations of a tester (ie, a single operator and instrument) on a single fabric" (15.0) in Table II indicates, however, that the real error affecting fabric comparisons lies in the inability of operators testing the same fabrics to obtain differences among them. This variability is much greater than that of multiple specimens measured by a single operator on a single fabric. Comparison of the mean square for "Testing methods × fabrics" (60.1) with that for "Manual testers × fabrics" (88.8) indicates that the results with the automatic tester from fabric to fabric are comparable to those of manual testers.

It is concluded from these experiments and analyses that the automatic tester may generally be substituted for manually operated testers for specimens that do not present alignment problems caused by twisting or curling.

As the automatic tester is further developed, expected advantages include increased number of tests per operator per unit of time, more objective measurements, reduction in operator fatigue, and savings in cost of testing.

ACKNOWLEDGMENT

Appreciation is extended J R Jung Jr, I W Lohmann, and R S Orr for their valuable suggestions leading to the development of this automatic wrinkle recovery tester; to Edna M Ellerbusch and H A Allen for test results with the Monsanto Wrinkle Recovery Tester; and to Ruby K Worner, H L E Vix, and J David Reid for assistance in the development of the tester, its evaluation, and preparation of this paper.

LITERATURE CITED

(1) AATCC Tentative Test Method 66-1956, "Evaluation of the Wrinkle Recovery of Fabrics by Means of the Wrinkle Recovery Tester," 1959 Technical Manual of the American Association of Textile Chemists and Colorists, Vol 35, pages 171-3.

(2) ASTM D 1295-53T, "Tentative Method of Test for Recovery of Textile Fabrics from Creasing, using the Vertical Strip Method," American Society for Testing Materials, Philadelphia, Pa.

(3) U S Federal Supply Service, Federal Specifications CCC-T-191b, "Method 5212, Crease Resistance of Cloth, Angle of Recovery Method," U S Government Printing Office, Washington, D C, 1951.

(4) British Standards Institution, Tentative Textile Standard No. 44, "Method of Test for the Recovery of Fabrics from Creasing." *J Textile Inst 48*, P326 (1957).

General Calendar

AMERICAN ASSOCIATION FOR TEXTILE TECHNOLOGY
May 4, June 1 (Della Robbia Room, Hotel Vanderbilt, New York, NY)

AMERICAN COTTON MANUFACTURERS INSTITUTE
Mar 23-25 (12th Annual Meeting, Fontainebleau Hotel, Miami Beach, Fla)

AMERICAN SOCIETY FOR TESTING MATERIALS
June 26-July 1 (Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, NJ)

AMERICAN TEXTILE MACHINERY ASSOCIATION
May 23-27, 1960 (American Textile Machinery Exhibition, Auditorium, Atlantic City, NJ)

CHEMICAL EXPOSITION USA
Sept 13-15 (Statler Hilton Hotel, New York, NY)

FEDERATION OF BRITISH INDUSTRIES
June 10-26 (British Exhibition of Industry, Technology, Science and Culture—Coliseum, New York, NY)

INTERNATIONAL TEXTILE MACHINERY EXPOSITION
1962 (3rd Exposition, Hanover, Germany)

NATIONAL ACADEMY OF SCIENCES
May 17-18 (Conference on Blend Fabrics, Quartermaster Research & Engineering Command, Natick, Mass)

NATIONAL COTTON COUNCIL
Sept 28-30 (9th Chemical Finishing Conference, Statler Hotel, Washington, DC)

SOUTHERN TEXTILE EXPOSITION
Oct 3-7 (Greenville, SC)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION
May 11-13 (Spring Outing, Shawnee Inn, Shawnee-on-Delaware, Pa); June 14, Sept 13, Oct 11, Dec 8 (Hotel Roosevelt, New York, NY)

TEXTILE OPERATING EXECUTIVES OF GEORGIA
Oct 22 (Harrison Hightower Bldg, Georgia Inst of Technology, Atlanta, Ga)

WOOL TEXTILE RESEARCH CONFERENCE
May 18-28 (Harrogate, England)

WORLD CONGRESS FOR MAN-MADE FIBERS
May 15-18, 1962 (2nd World Congress, London, England)

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Proceedings of the
American Association of Textile Chemists and Colorists

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May 2, 1960 No. 9

38th National Convention———

TWELVE MILLION YARDS OF NATURAL AND MAN-MADE FIBERS DYED ON THE SWEDISH PAD-ROLL DYEING MACHINE*

ROBERT M LESH
Superintendent
Northern Dyeing Corp
Washington, NJ

INTRODUCTION

IT is a great privilege to be able to stand before you today and discuss our experiences with the Swedish Pad-Roll Dyeing machine. We have operated our unit for more than two years on an almost continuous basis and have successfully dyed over 12,000,000 yards of almost every type of fiber and fabric.

Two major factors greatly influenced the decision to purchase the pad-roll machine. The most important factor was the ever-rising cost of labor, dyestuffs, and chemicals, and the second factor was the promise of consistently superior quality coupled with our need to become more versatile.

To illustrate the versatility of the machine we need only to examine our own specific case. Two years ago we were regarded as a specialty dyeing and finishing plant processing fabrics of cotton and rayon almost exclusively. Today the bulk of our production is in Dacron/cotton, nylon/cotton, and acetate/cotton blends for the menswear, womenswear, and rainwear trade.

Almost 80% of our work in these fields is completely dyed on the pad-roll machine, even difficult cross-dyes.

Prior to the installation of the pad-roll machine, our dyehouse consisted of twelve jigs working two eight-hour or ten-hour shifts. The pad-roll was so productive that we eliminated the entire second shift by operating the machine only one ten-hour shift with two men.

We did not purchase the machine to greatly increase production, but rather to produce an equal or superior product in a more efficient and economical manner, although the machine does have a great capacity for production.

The Swedish Pad-Roll machine has fulfilled its promise to Northern Dyeing Corporation.

DISCUSSION

THEORETICAL CONSIDERATIONS——Although there have been three prior publications concerning the principle of this machine (*1,2,3*), we will briefly review the principles at this time. Since there are three phases through which dyes must pass in order to fix themselves within any fiber, ie, diffusion throughout the dye liquor, adsorption onto the fiber surface, and absorption or diffusion into the fibers themselves, a padding technique utilizing a very low cloth-to-liquor ratio is ideal for level even adsorption onto the fiber surfaces. Almost instantaneous adsorption is achieved at padding speeds of up to 80 yards per minute.

The absorption or diffusion of the dyes into the fibers is a slow process, requiring from one to six, and sometimes eight hours, depending on the shade and dyestuffs involved, to reach equilibrium. The rate of diffusion is dependent upon the particle size of the dye molecule, the degree of aggregation of the dyestuffs, the kinetic energy of the system, and the type of fiber and construction of the fabric to be dyed.

For a dyestuff to have optimum wetfastness, its molecules must diffuse into the innermost fibers in such a way that the distribution is even throughout the entire cross section of the fiber, and complete equilibrium

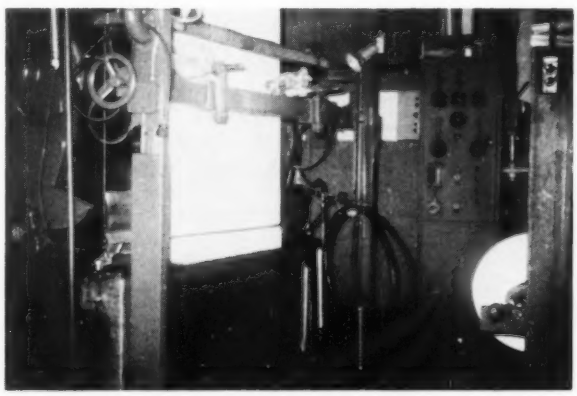
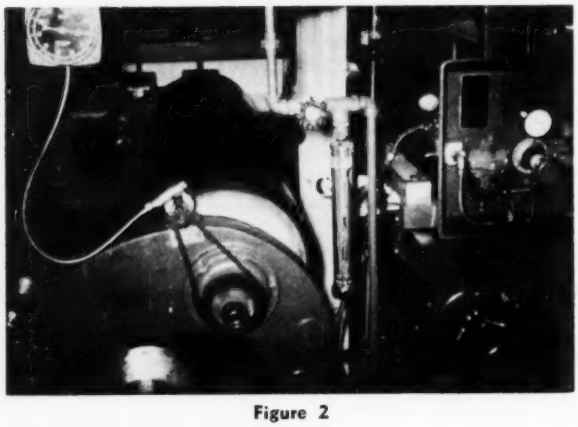


Figure 1

*Presented October 9, 1959 at the 38th National Convention, Washington, DC



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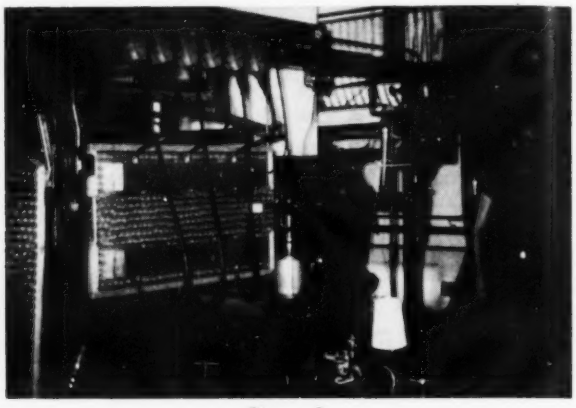
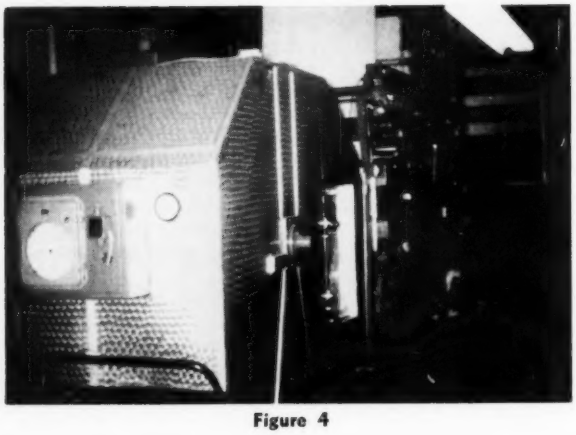


Figure 3



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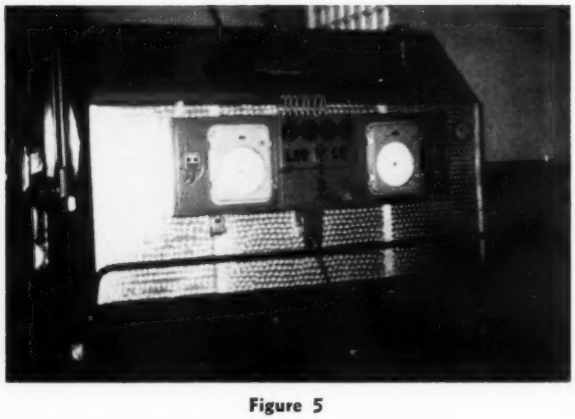

Figure 5

must exist. To accomplish this it is necessary to keep the dye impregnated fabric at a predetermined temperature and humidity for the time necessary to obtain this equilibrium.

These principles or conditions, which constitute the ideal situation, are achieved by the pad-roll dyeing machine. The Swedish inventors, C O Eriksson and N Landquist, designed a hermetically sealed chamber into which cloth could be placed immediately upon padding. Experimentation showed that if the wet-bulb temperature of the sealed chamber was maintained close to the dry-bulb temperature, the padded adsorbed dyestuff would remain in the identical fluid state in which it was padded until absorption was complete.

THE PAD-ROLL MACHINE——Briefly, as seen in Figures 1-4, the machine consists of a temperature-controlled storage tank system for feeding the four-gallon steam-jacketed pad tank by means of a liquid level controller, a 10 kg/cm^2 dye padder, an infrared zone consisting of 18 quartz tubes (designed to raise the impregnated cloth temperature above the temperature of the preheated batching chamber to prevent condensation of moisture on relatively cold cloth), and the hermetically sealed batching chamber. This sealed chamber is mounted on wheels and can be removed from the padding unit and stored until such time as the dyeing is complete. Figure 5 shows the chamber in storage. Meanwhile another chamber can be attached to the basic padding unit and filled, and so on, thus making the system, for all practical purposes, a semicontinuous, batchwise dyeing system.

These chambers can accommodate anywhere from 4000 yards of a heavy fabric to 12,000 yards of a lightweight fabric. During the diffusion time after padding the chamber is continuously rotated by means of a small turning motor. Completed dyeings are removed from the chambers by unrolling them in the same way that the cloth entered, through a series of dips and a padder squeeze and suction, and then dried.

For a more detailed description, I refer you to the literature (*1,2,3*).

DYESTUFFS FOR PAD-ROLL——The various types of dyes which are suitable for the pad-roll are many, but must be carefully selected with respect to dye solubility or dispersibility. For direct dyeings the dyes must be soluble enough at the padding temperature to be padded in the soluble state and remain in the soluble state throughout the dyeing cycle. They should contain as little electrolyte as possible. However, one may use successfully almost any of the dyestuffs which are suitable for conventional padding methods provided the solubility requirement is met.

Acid dyestuffs are also suitable, although many are limited in solubility and careful selection must be made. Disperse dyes must, of course, be finely dispersed and very carefully selected for stability of dispersion for at least four hours. Cationic dyes, fiber-reactives, soluble vat colors, and premetallized dyes can all be

used successfully, but each requires individual attention in the laboratory for each specific shade and fabric.

Dye costs resulting from the pad-roll method are generally somewhat lower, since the only waste is the four gallons needed to fill the pad-pan which remains after the dyeing. Therefore, there is about 96% utilization of the pad-liquor. However, in some cases where the solubility of a dyestuff is a factor, it may be necessary to use a more expensive dyestuff than would normally be used in order to obtain the solubility required.

LABORATORY MATCHING——Laboratory matching involves a technique that is an exact duplicate of the operation of the production machine. The padder is made to duplicate the production machine, and an oven is used for conditioning the laboratory samples. Figure 6 shows the laboratory technician padding a sample with color. The sample is then rolled on a tube as shown in Figure 7, sealed with aluminum foil, and placed on end in the conditioning oven, as shown in Figure 8. The sample remains in the oven for anywhere from one to eight hours, at which time it is removed and rinsed in warm water. If it shows any degree of bleeding, then the next dyeing is left in longer, since it is evident that the diffusion was not complete.

Laboratory matching is very difficult for several reasons. First, the length of time it takes before full diffusion takes place makes it difficult to get an exact match in less than two or three days, and it often takes longer on difficult shades or blends of fibers. Secondly, the laboratory work must be very accurate, since the laboratory formula is expanded from a 50 milliliter solution to 800 liters on the production machine. Third, the match must take into account and predict exactly the shade change with finish, heat setting, calendering, and any other operations which may affect the final shade. Fourth, every fabric and every shade is a distinctly separate entity, demanding extreme care in formulating.

Figure 6

FABRICS FOR THE PAD-ROLL MACHINE——To date we have been successful in the dyeing of most fabrics that have sufficient pickup or carrying power to pad and batch evenly and that run well mechanically. Tight selvedges tend to roll, some fabrics have a tendency to crease in the heat of the infra-red zone, and some have a tendency to turn over at the seam along the selvedge. We have been successful in the dyeing of Orlon/wool, Orlon/rayon, Dacron/cotton, nylon/cotton, acetate/cotton, silk/cotton, rayon/cotton, Belgian linens, Creslan, Verel, Topel, Dynel, viscose, and Bemberg fabrics.

However, do not let this impressive list of fibers give you the idea that this machine is the answer to all types of dyeing and all types of fabrics. Sheers and lightweight fabrics, particularly in the 100% hydrophobic class, and particularly in filament constructions, present serious research and development problems.

CROSS-SECTIONAL STUDIES——To establish the quality of the dyeings obtained from the pad-roll technique, we felt that studies of comparative cross sections of various types of fabrics would best confirm or deny the basic theory on which the pad-roll technique was founded. Table I shows the results of a series of microscopic studies made in the laboratories of American Cyanamid Co under the direction of Henry E Millson. In addition there are slides made in the laboratories of Ciba in Basle.

Judging from these comparative studies it is evident that the basic theory of the pad-roll technique is sound and that superior dyeings can be achieved.

SUMMARY

There are a number of distinct advantages of dyeing by the pad-roll method:

1) Economy of operation from the standpoint of labor.
2) Color yield is about 96%, thus a savings in dyestuff costs can be realized.
3) Optimum penetration can be achieved, thus realizing maximum fastness from dyeings.
4) Versatility in types of fabrics that can be successfully dyed by this method.
5) Uniform dyeings in large runs can be achieved.
6) Perfect repeat of shades, once standardized.

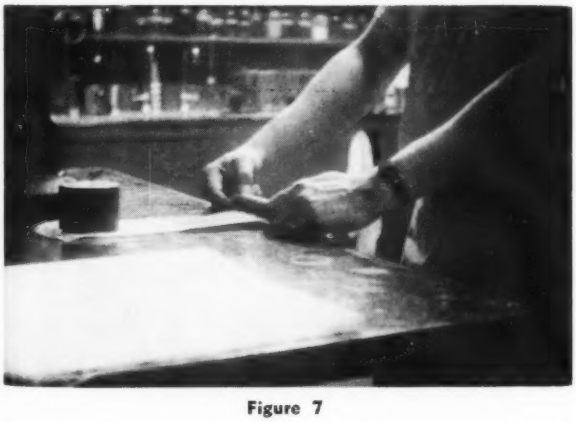

Figure 7

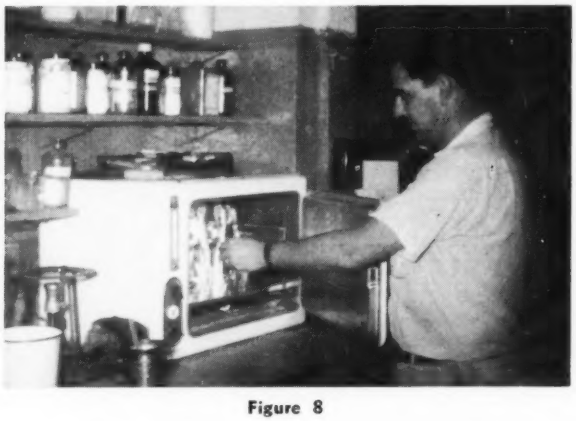

Figure 8

TABLE I

Comparative studies of cross sections

Fabric	*Fiber sectioned*	*Observations*	*Fabric*	*Fiber sectioned*	*Observations*
Rayon/cotton bengaline—jig dyed red	viscose	Poorly penetrated; uneven dyeing	Rayon/cotton bengaline—Pad-roll dyed red	viscose	Complete diffusion
Rayon/cotton bengaline—jig dyed red	viscose	Uneven dyeing	Rayon/cotton bengaline—Pad-roll red	viscose	Complete diffusion
Rayon/cotton bengaline—jig dyed red	cotton	Rayon heavy; cotton light; unevenly dyed cotton	Rayon/cotton bengaline—Pad-roll red	cotton	Rayon/cotton better union; generally even on cotton
Rayon/cotton bengaline—jig dyed blk	viscose	Dark and light areas on viscose; cotton uneven	Rayon/cotton bengaline—Pad-roll blk	viscose	Complete diffusion; better union
Rayon/cotton bengaline—jig dyed blk	cotton	Unevenly dyed; lack of union	Rayon/cotton bengaline—Pad-roll blk	cotton	Evenly dyed; better union
Cupioni—beck dyed black	cotton	Surface dyed; poor penetration	Cupioni—Pad-roll black	cotton	Completely dyed; good penetration
Cupioni—beck dyed black	bemberg	Appears overdyed and slightly uneven	Cupioni—Pad-roll black	Bemberg	Evenly dyed (no large diameter yarns)
Cupioni—Pad-roll navy	cotton	Evenly dyed; union between cotton and bemberg	Cupioni—Pad-roll navy	Bemberg	Evenly dyed; thick and thin dyed to same degree
Nylon/cotton—jig dyed blue	nylon	Unevenly penetrated; ring dyed	Nylon/cotton—Pad-roll blue	nylon	Completely penetrated
Nylon/cotton—jig dyed green	cotton	Unevenly dyed	Nylon/cotton—Pad-roll green	cotton	Completely penetrated
Cotton/acetate—jig dyed grey/orange	acetate	Unevenly dyed; poor penetration	Cotton/acetate—Pad-roll grey/orange	acetate	Evenly dyed; completely penetrated
Cotton/acetate—jig dyed grey/orange	cotton	Good penetration	Cotton/acetate—Pad-roll grey/orange	cotton	Good penetration
Arnel faille—pigmented Pad-roll turquoise shade	Arnel	Complete, even diffusion	Acetate—Pad-roll red	acetate	Complete even penetration
Silk—jig dyed black	silk	Very poor penetration; surface color	Silk—Pad-roll black	silk	Excellent penetration; no surface color
Orlon/wool—beck dyed	Orlon/wool	Orlon very heavily ring dyed	Orlon-wool—Pad-roll red	Orlon/wool	Not a union; Orlon completely dyed
Linen (flax)—Pad-roll red, fiber-reactive dyes	warp	Excellent penetration	Linen (flax)—Pad-roll red, fiber-reactive dyes	filling	Excellent penetration
63/35 Dacron/cotton—purple union, Pad-roll	Dacron/cotton	Good union; no ring dyeing; good penetration	65/35 Dacron/cotton—cerise shade Pad-roll	Dacron/cotton	Good union; no ring dyeing; excellent penetration
Dacron/cotton—kelly green, Pad-roll	Dacron/cotton	Not a union; good penetration both fibers	Dacron/cotton—brown union Pad-roll	Dacron/cotton	Excellent union; good penetration no ring dyeing

There are also a number of disadvantages:

1) Time consuming, extremely accurate laboratory work necessary for matching of shades.
2) Any error, either by the drug room or in the formula, cannot be observed until after the dyeing is complete.
3) Standardization of dyestuffs must be very accurate or formulas will not repeat.
4) An absolutely clean uniform base for dyeing is much more important for the pad-roll machine than in any other type of dyeing or formulas will not repeat and poor dyeings can occur.
5) Small lots of less than 2500 yards can not be dyed advantageously, although as little as one piece can be dyed.
6) Clean-up time for dark shades on the machine is sometimes difficult.
7) Constant attention to all details and close control of the operation as a whole is a must for success.

Taking all these factors into careful consideration, we believe the advantages of the pad-roll system outweigh the disadvantages, and that this new method of dyeing is an extremely important contribution to the dyeing industry as a whole.

REFERENCES

(1) Eriksson, C O, Landquist, N, and, Mellbin, B, "The Pad-Roll Dyeing System and Its Application", *Am Dyestuff Reptr 44*, No. 25, P877-81 (Dec 5, 1955).
(2) Mellbin, Bertil, "New Aspects of the Pad-Roll System", *ibid* 46, No. 21, 770-7 (Oct 21, 1957).
(3) Percarpio, F J, Lesh, R M, and Thackrah, John S, "Practical Experience with the Pad-Roll Dyeing Machine", *ibid 48*, No. 15, 41-43 (July 27, 1959).

South Central Section———

CHEMICAL PRINCIPLES OF DYEING AND FINISHING*

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INTRODUCTION

A very large number of materials are used in the dyeing and finishing of textiles. Some of these play primary roles in the various processes, for example, dyes. Others are present to assist or modify the action of the primary agents, for example, wetting agents. The way in which both primary and auxiliary agents act depends upon their own inherent characteristics and also upon any agent-agent or agent-fiber interactions that can occur. The situation can become very involved but, fortunately, it is possible to describe any system in terms of a limited number of principles. Each component can be classified according to type and the important interactions predicted, at least qualitatively. It is the purpose of this paper to describe the common textile fibers, dyes and finishing agents in terms of their most important chemical characteristics as an aid to understanding their behavior.

DISCUSSION

Before beginning a discussion of principles, it is necessary to define several terms that are encountered frequently in any description of the chemistry of dyeing and finishing. The first of these is *pH*. This is a simplified way of giving the acidity or alkalinity of an aqueous solution without the use of exponential numbers. The pH is defined as shown in Figure 1 as the negative of the logarithm of the hydrogen ion concentration. In a neutral aqueous solution, the hydrogen ion concentration is 10^{-7} gram ions per liter. Application of the equation of Figure 1 converts this exponential number to a 7. In like manner, it is possible to describe solutions with smaller or greater hydrogen ion concentrations. Thus, pH values below 7 describe acidic solutions, and pH values above 7 describe alkaline solutions.

$pH = -\log_{10}[H^+]$
Neutral $pH = 7$
Acidic $pH = < 7$
Alkaline $pH = > 7$

Figure 1

Terms used in describing a number of important materials are *nonionic*, *anionic* and *cationic*. These terms refer to the inability or ability of a compound to produce charged particles in aqueous solution. A nonionic compound may be represented (Figure 2) as an entity devoid of electrical charge. An ionic compound, on the other hand, is one that splits into parts called ions when dissolved in water, some parts bearing negative charges, the others positive charges. By convention, the compounds are described according to the nature of the charge on the ion in which we are most interested. Usually, this is a large organic ion, while the other is a small inorganic ion. A negatively charged ion is called an *anion* since it is attracted to a positively charged electrode or anode. Thus, in Figure 2, when a negative charge resides on the larger, organic ion, we call the compound anionic. Conversely, a positively charged ion is called a *cation* since it is attracted to a negatively charged electrode or cathode, and we call compounds such as the third in Figure 2 cationic. Of course, to preserve electrical balance, every ionic material must consist of parts having equal numbers of positive and negative charges. The naming depends upon which of these we choose to emphasize.

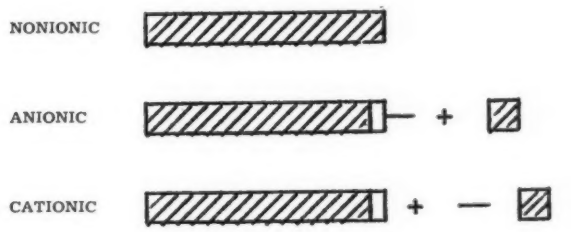

Figure 2

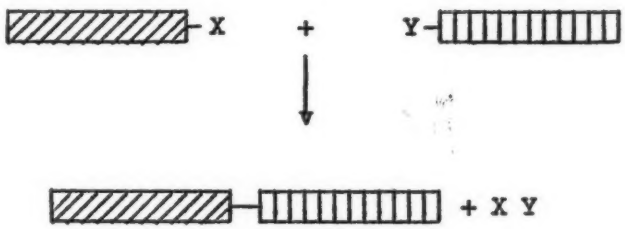

Figure 3
Functional compounds

Chemical compounds are often referred to as *functional* or *nonfunctional*. These terms have a precise meaning only when a system is fully defined. Generally, however, a functional compound is one that can undergo reaction with another functional compound to form a new third compound. Figure 3 pictures such a reaction. We will come to some specific examples of chemical functionality a little later.

Another set of terms of importance

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Presented before the South Central Section in September, 1959

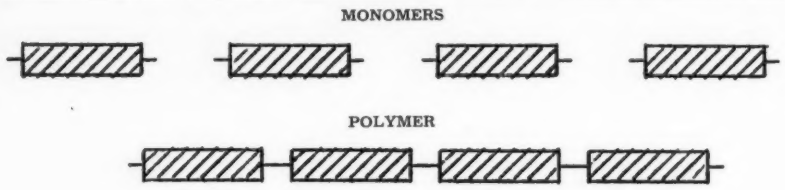


Figure 4

are *monomer* and *polymer*. A monomer exists as individual small molecules as shown at the top of Figure 4, but these molecules have the ability to join together to form larger molecules. These larger molecules are called polymers. They may consist of a few monomer units joined together or of many thousands of units. The properties of polymers, especially high polymers, are very different from those of monomers. Many important polymers are made by joining monomers of two or more different kinds.

The term *surfactant* is a difficult one to define. It refers to the ability of a compound to affect the forces that operate at surfaces or boundaries between solids, liquids and gases. From our present viewpoint, we may define surfactants as large molecules with portions that are compatible with water (hydrophiles) and portions that are not compatible with water (hydrophobes) (see Figure 5). The presence of these two opposing elements in a molecule causes it to act in unusual ways. The hydrophilic portion tends to dissolve in water but is held back by the hydrophobic portion. The hydrophobic portion tends to dissolve in organic substances but is held back by the hydrophilic portion. As a consequence, surfactant molecules tend to collect at the boundaries between water and organic substances and alter the conditions at these boundaries. The hydrophilic portion of a surfactant may be nonionic, anionic, cationic or amphoteric (having both a positive and a negative charge). The hydrophobic portion usually consists of a long hydrocarbon chain.

Figure 6 lists some of the important kinds of surfactants. Surfactants are effective *wetting agents* since they are able, by virtue of their dual nature, to act as links between dissimilar materials and reduce boundary tension. Many surfactants are *detergents*. They wet fabric to permit removal of soil and act to surround the soil and keep it from returning to the fabric.

A distinction is made between soaps and synthetic detergents. Soaps are sodium or potassium salts of long-chain fatty acids. They are effective detergents in soft water, but tend to form precipitates with calcium or magnesium ions in hard water. Synthetic detergents usually retain their effectiveness in hard water either because they are nonionic and do not form salts, or because they are based on anions or cations of a kind that do not tend to form insoluble salts.

Surfactants can often act very effectively as *dispersing* or *emulsifying* agents. They coat the material to be dispersed or emulsified and act to keep it from separating or precipitating from solution.

A valuable property of some surfactants is their ability to *soften* fabrics. The hydrophobic part of the molecule acts as a lubricant for the fibers. The function of the hydrophilic part is to confer solubility on the surfactant and, in some cases, to improve affinity for textiles.

With the foregoing definitions of terms in mind, we can now proceed to a discussion of textile fibers and textile-treating agents.

Some important chemical features of textile fibers are given in Figure 7. All textile fibers are made up of polymers of high molecular weight. That is, they consist of long chain-like molecules that possess unique properties of strength and flexibility.

Among the most obvious properties of a fiber is its ability to be wetted and swollen by water. A fiber that is wetted easily is called hydrophilic; an example is cotton. A fiber that is difficult to wet is called hydrophobic, for example, Dacron polyester fiber. Naturally ability to be wetted depends upon the chemical composition of the polymer that makes up the fiber, and upon certain of the physical characteristics of the fiber.

The functional nature of a textile fiber refers to its ability to undergo chemical reaction, for example, with reactive dyes or textile finishes. Cellulosic fibers are functional toward dyes or finishes that can react with hydroxyl groups, while Dacron polyester fiber is not functional toward these compounds.

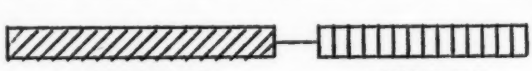


Figure 5
Surfactants

Anionic
Cationic
Amphoteric
Nonionic

Wetting agents
Detergents - soaps
Emulsifiers
Softeners

Figure 6

Polymeric
Hydrophilic or hydrophobic
Functional or nonfunctional
Anionic, cationic, amphoteric or nonionic

Figure 7
Textile fibers

Liquid or solid
Soluble or insoluble
Surface-active or nonsurface-active
Monomeric or polymeric
Functional or nonfunctional
Anionic, cationic, amphoteric or nonionic

Figure 8
Textile agents

Occlusion
Adsorption
Ionic bonding
Covalent bonding

Figure 9
How compounds are held in fibers

Solution
Surface action
Salt formation
Covalent bond formation (rare)
Oxidation-reduction

Figure 10
Agent-agent interactions

Wetting
Emulsifying
Swelling
Competing (to retard)
Fixing
Mass action

Figure 11
Auxiliary agent action

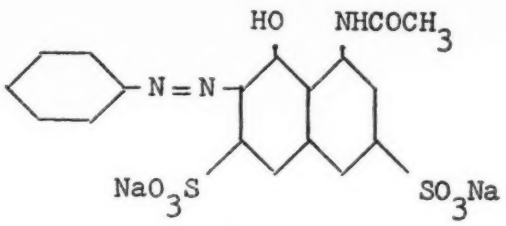


Figure 12
An acid dye

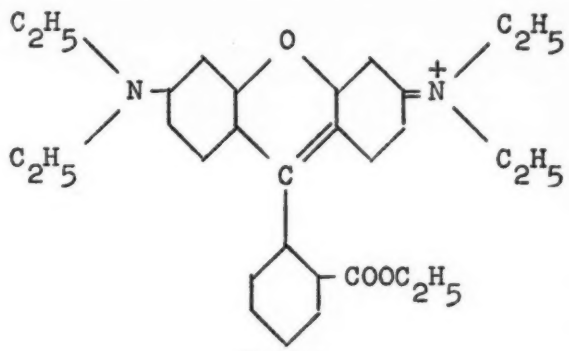


Figure 13
A basic dye

Finally, textile fibers can be classified as anionic, cationic, amphoteric or nonionic. To illustrate, wool is amphoteric since it consists of polyamide chains with both anionic and cationic groups. Cellulosic fibers, on the other hand, are composed of polycellobiose chains having no salt-forming groups; they are classified as nonionic.

Agents used in the processing of textile fibers, including dyes, can be described in terms of the features shown in Figure 8.

Perhaps the most outstanding property of any material is its physical form, that is, liquid, solid or gaseous. Most common textile chemicals are solids, but a few, including some nonionic surfactants and carriers, are liquids. Liquids that are not highly soluble in water must be handled with care to be sure that they are well emulsified and do not spot out on the fabric.

Surface-active properties are common in textile chemicals, even those not classified as surfactants. Many dyes consist of large organic moieties solubilized by ionic groups. Such molecules exhibit surface activity.

With the exception of surfactants, most agents used in dyeing are monomeric. Finishing agents, however, are frequently polymeric or are polymerized on the fabric. Resins used to improve crease resistance, antistatic agents and many others form polymeric phases in intimate contact with textile fibers. The presence of a foreign polymer naturally has a pronounced effect on the properties of the fabric. This effect is generally much greater than can be expected from a monomeric agent.

The chemical functionality of textile-treating agents can be of extreme importance. As discussed previously, reactive dyes can be used only on functional fibers.

As was the case with textile fibers, it is necessary to consider textile-treating agents in terms of their electrical charges in solution. As will be seen, knowing whether an agent is anionic, cationic, amphoteric or nonionic is all-important in predicting its behavior.

The primary agents used in dyeing and finishing are intended to become fixed to textile fibers in some way. Figure 9 lists the important ways in which an agent can become fixed. The first is occlusion or simple entrapment, and may be regarded as a purely physical effect. An insoluble pigment that is precipitated in a fiber or a resin that is polymerized on a fabric may be held in this way.

The next three terms, adsorption, ionic bonding and covalent bonding, describe types of chemical linkage. Adsorption is the weakest of the three; it depends upon a variety of secondary forces that operate between molecules. Ionic bonding operates between ions of opposite charge. Molecules and ions that are joined by adsorption or ionic bonding usually are quite easily separated again. Covalent bonding, on the other hand, involves a direct linkage that is broken only with great difficulty.

Figure 10 shows some of the most important interactions that can occur between textile chemicals. It will be seen that both physical and chemical effects are included.

Figure 11 lists the actions that are desired from auxiliary agents during dyeing and finishing. The interactions shown in Figure 10 are those that *can* occur, while the functions listed in Figure 11 are those that are performed when the interactions between agents are correctly planned and controlled. In this connection, special attention must be given to salt formation.

Because unlike charges attract and like charges repel, many of the most important interactions that can take place during dyeing and finishing are easily predicted. As an example, cationic dyes can be expected to have affinity for anionic fibers. When cationic, nondye agents also are present in the dyebath, they will compete with the dye for the anionic sites in the fiber and slow down the dyeing rate. The addition of anionic agents ica effects are included.
must be considered most carefully since attraction between them and the dye may cause precipitation.

The last term in Figure 11, mass action, will be explained later when direct dyes are discussed.

Dyes are a special group of textile-treating agents. They are highly colored, of course, but in many ways not basically different from colorless textile chemicals. A discussion of the application classes of dyes, therefore, can be used to illustrate generally how textile-treating agents act toward fibers and toward each other.

Figure 12 gives the structure of a typical acid dye. This one happens to be an azo dye, but that feature is not so important as is the presence of sulfonate groups. These groups ionize in water to give negatively charged dye ions and positively charged sodium ions. By convention, we call this an anionic dye.

An anionic dye can be expected to show affinity for any fiber that bears positive charges, that is, any cationic or amphoteric fiber. Examples are wool, silk and nylon. We can predict also that other anionic agents in the dyebath will compete with the dye in combining with the fiber. Anionic surfactants or simple inorganic salts, such as sodium sulfate, can be expected to slow down the dyeing rate of anionic dyes. Cationic agents, on the other hand, may well cause precipitation of the dye as an insoluble salt. If cations are to be used, as is sometimes done to modify the dyeing process, an effective nonionic surfactant should be present to keep the dye salt in dispersion.

A typical basic dye is shown in Figure 13. There is a positive charge on

the molecule and this is, therefore a cationic dye. The anion, not shown, is a chloride or acetate ion. Cationic dyes have affinity for anionic and amphoteric fibers. Acid-modified acrylic fibers, for example, are dyed with

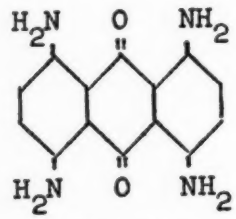


Figure 14
A disperse dye

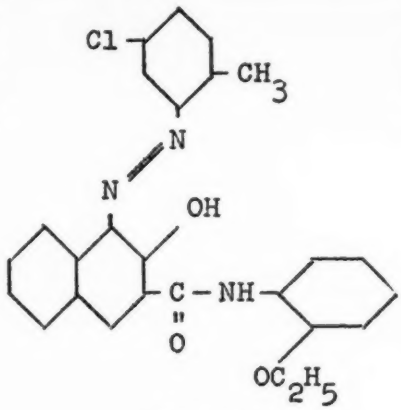


Figure 15
A developed dye

reduced to the hydroquinone form with sodium hydrosulfite and alkali. Once reduced, they are soluble and are adsorbed quite strongly by cellulose. After adsorption, they are oxidized back to the original pigmentary,

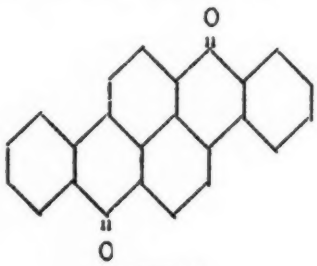


Figure 16
A vat dye

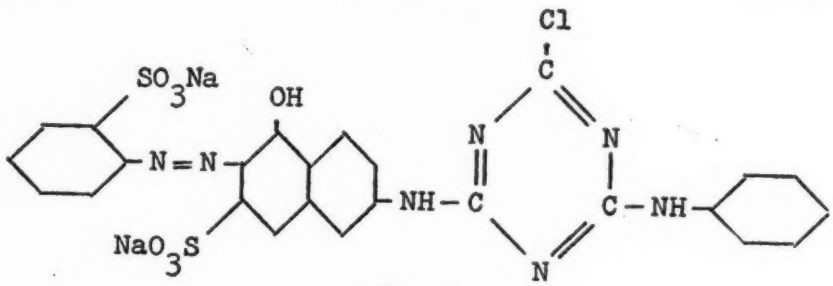


Figure 17
A reactive dye

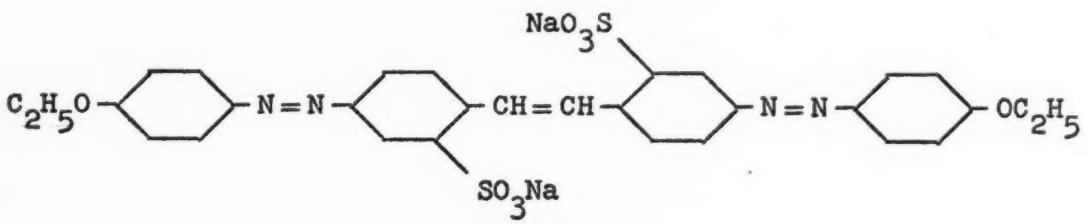


Figure 18
A direct dye

cationic dyes. Retarders for cationic dyes are colorless cationic materials that can compete with the dye for the anionic sites in the fiber. Anionic additives usually are avoided because they may precipitate the dye. If they must be used, a nonionic surfactant is added to disperse the dye salt.

Figure 14 pictures a nonionic dye. This is a disperse dye useful for dyeing any fiber in which it can dissolve, for example, cellulose acetate. Disperse dyes have very low water solubility and are kept in a fine state of dispersion by the use of surfactants. Although the water solubility of disperse dyes is low, the dyeing process involves a transfer of dye molecules from the dispersed phase to the fiber by way of solution in water. Thus, a completely water-insoluble dye can not function as a disperse dye. Highly water-soluble dyes, on the other hand, are not useful because they tend to remain in the water and not dye the fiber.

The azoic dye shown in Figure 15 illustrates one kind of developed dye, that is, a dye that is produced by reaction inside a fiber. The coupling component, shown at the bottom, is first used to impregnate the fabric, and then diazo component (top) is applied to form the dye. The dye has low solubility and is held in the fiber by forces of adsorption. Azoic dyes are useful for any fibers in which the components can be dissolved. Their major use is for cellulosic fibers.

Vat dyes are an especially interesting group since they require chemical reaction to prepare them for use. Figure 16 gives a typical structure. Vat dyes are insoluble pigments until insoluble state and remain occluded in the fiber. The reduced form of a vat dye is compatible with nonionic and anionic agents, but cationic agents may cause precipitation unless the system is well stabilized with a nonionic surfactant.

Figure 17 shows a reactive dye of the chlorotriazine type. The functional portion of the molecule is the chlorine atom. Dyes like this form covalent bonds with fibers having active hydrogen atoms. Their most important use is on cellulosic fibers with which they form ether linkages in the presence of alkali. Most chlorotriazine dyes have sulfonic acid groups to confer water solubility, and are thus anionic as well as reactive dyes. It is possible for them to dye cationic and amphoteric fibers with-

(*concluded on page 41*)

Metropolitan Section———

THE DYEING OF ACRILAN 16 AND ACRILAN 16/ACRILAN BLENDS*

THOMAS E CROXSON
The Chemstrand Corp
Decatur, Ala

INTRODUCTION

AFTER approximately ten years, we at Chemstrand and many of our customers have become acquainted with Acrilan acrylic fiber. Based on experience earned through years of laboratory investigation and plant production, we know how to satisfactorily dye Acrilan for numerous end uses. Now a new-type Acrilan recently has been made commercially available by the Chemstrand Corporation. This fiber, known as Acrilan 16, is characterized by softness of hand, warmth, and high bulk to weight ratio. Due to its good natural color and its ease of dyeing, Acrilan 16 is ideally suited for the knitted outerwear trade. While the basic physical properties of Acrilan 16 are similar to those of Acrilan, its dyeing properties are very dissimilar, and we are faced with the task of learning the dyeing peculiarities of this new and unusual acrylic fiber.

Acrilan 16 is dyeable with disperse and basic dyes, and unlike Acrilan, has no affinity for acid, chrome, neutral premetallized, or other wool-type dyes. Although disperse and basic dyes are suitable for dyeing both Acrilan and Acrilan 16, the results obtained are remarkably different. Disperse dyes will produce a full color range from beige to black on Acrilan; however, they do not readily exhaust in heavy depths on Acrilan 16. Therefore their usefulness on Acrilan 16 is limited to light and medium heavy shades. Basic dyes, on the other hand, build up to any practical shade and are well suited for dyeing heavy shades and black on Acrilan 16. This is not the case with Acrilan where it is impractical to dye heavy shades with basic dyes. These differences in dyeing characteristics between fibers whose physical properties and processability are otherwise so very similar make Acrilan 16 and Acrilan ideal for use in combination. By proper selection of dyestuffs and dyeing conditions, an almost limitless range of attractive two-tone pattern effects may be developed. Alternatively one component may be dyed and the other left undyed. The number of fabric styles which can be developed in heather or pattern effect is limited only by the skill and ingenuity of the weaver or knitter.

*Presented before the Metropolitan Section on February 19, 1960 at the Hotel New Yorker, New York NY

DISCUSSION

PREPARATION ——— Acrilan 16, in itself, requires little or no preparation. It is shipped to manufacturers clean and free from foreign contamination and can be dyed without extensive pretreatment; however, goods should be adequately scoured to remove tint, size, wax, grease, spinning oil, or any other impurity picked up during textile processing. The type and severity of the scour will be dependent on the type and amount of impurities present. Generally speaking, 100% Acrilan 16, or Acrilan 16/Acrilan blends can be adequately scoured at 160°F with 0.5%-1.0% of a nonionic detergent plus 0.5% TSP or TSPP. In the case of blends with natural or other man-made fibers, the requirements of the other fiber component will usually determine the preparation treatment.

BLEACHING ——— The natural whiteness of Acrilan 16 is adequate for most end uses without bleaching. If, however, an extremely bright white is required, a mild sodium chlorite bleach will suffice. Optical bleaching agent can be added to enhance the whiteness obtained from bleaching, or alternatively to improve the natural whiteness of the fiber without bleaching. A typical bleaching formula is shown in Table I.

TABLE I
Typical bleach formula for Acrilan 16

1) Set bleach bath at 100°F with:
   0.4 g/l phosphoric acid
   0.3 g/l Textone (sodium chlorite 75-77%)
   0.5% nonionic surfactant
   0.3% Uvitex A.
2) Heat to 200°F and run 20 minutes.
3) Cool to 160°F by radiation and rinse clear.
4) Antichlor and neutralize in a fresh bath at 140°F with:
   1.0 g/l sodium bisulfite
   1.0 g/l sodium bicarbonate.

It has never been found necessary to bleach Acrilan 16 in preparation for dyeing bright shades. The natural color of the fiber, in itself, is clean enough to allow the dyer to produce even the brightest shades.

DISPERSE DYES ON ACRILAN 16———Disperse dyes as a class have excellent dyeing properties on Acrilan 16, and their fastness properties are considerably higher than on Acrilan acrylic fiber. With proper dyestuff selection, there is no difficulty encountered in obtaining 40 hours lightfastness and 140°F washfastness in shades up to the medium heavy range. Whereas only a limited selection of disperse dyes are suitable for dyeing Acrilan with good light and washfastness, a wide variety of inexpensive disperse dyes will give good results on Acrilan 16. The one disadvantage of disperse dyes on Acrilan 16 is that they do not build up to shades beyond medium heavy depth. To illustrate this point, we have plotted dye absorption curves for three typical disperse dyestuffs; CI Disperse Red 20, Eastman Fast Yellow W-GLF, and CI Disperse Blue 3. These curves are shown in Figures 1, 2 and 3. As you can see from these curves, a reasonable amount of dyestuff added to the dyebath is exhausted onto the fiber until a 3.0% to 4.0% dyeing is reached. After we have used 3.0% to 4.0% dye in the dyebath, we realize very little additional color build-up for a large percentage of dye added. For example, with Eastman Fast Yellow W-GLF, when we add 4.0% dye to the dyebath, 3.33% will be absorbed by the fiber. When we increase the amount of dye used to 7.0%, only 3.65% is absorbed by the fiber We have used 3.0% more dye in the dyebath yet exhausted only 0.32% more dye on the fiber. This obviously means that the dyer would receive only 10% to 15% of the value of the dyestuff added above 4.0%. Because of this phenomenon, we do not recommend the use of disperse dyes for shades requiring more than approximately 4.0% total dyestuff.

BASIC DYES ON ACRILAN 16 ———Basic dyes exhibit excellent light and washfastness properties on Acrilan 16, and because they have good build-up properties, a full range of shades from beige to black can be obtained economically and without difficulty. Acrilan 16 has a more rapid dye rate with basic dyes than Acrilan and the rate of dyeing must be retarded to insure levelness. Generally speaking, there are two distinctly different techniques for controlling the dyeing rate of Acrilan 16. They are 1) Cationic Retarder System, and 2) Anionic Complex System. Both of these simple dyeing techniques will slow down the dyeing rate of basic dyes without materially affecting the final exhaustion.

In the Cationic Retarder System, the rate of dyeing is controlled by adding a small percentage of a cationic auxiliary to the dyebath. This cationic auxiliary competes with the cationic dye for available dye sites, thereby temporarily impeding dyeing and slowing down the rate of exhaustion. It has been proven that a retarder is unnecessary for extremely heavy shades such as navies, browns, and blacks.

The Anionic Complex System, recently developed by Geigy Dyestuffs, and referred to by them as the I-T Process (*1*), is dependent upon the ability of cationic dyes to form a comparatively loose chemical complex with an anionic auxiliary, Irgasol DA. This cationic dye-anionic auxiliary complex is held in a state of colloidal dispersion with a nonionic auxiliary, Tinegal NA. The anionic auxiliary satisfies the cationic attraction of the dyestuff, and the resultant complex is adsorbed onto the fiber in much the same manner as a disperse dye. At temperatures below the boil, this complex is loosely held to the fiber and considerable migration and leveling takes place. As the temperature approaches the boil, this complex gradually breaks down, allowing the basic dye to diffuse into the fiber, and the anionic material is returned to the dyebath. The Anionic Complex System produces levelness by satisfying the chemical attractive force of cationic dyes, by equalizing the drawing rates of different dyestuffs, and by promoting migration during the early stages of dyeing.

DYEING ACRILAN 16-ACRILAN BLENDS———Basic dyes are best applied to Acrilan acrylic fiber from a neutral or slightly alkaline dyebath; they have diminishing affinity for

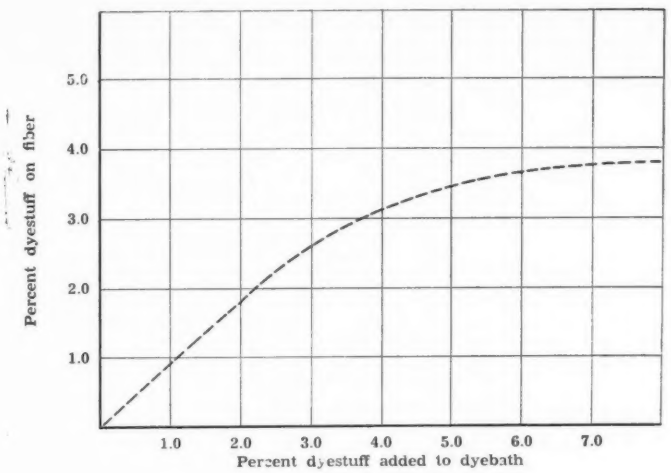


Figure 1
Acrilan 16 dyed with CI Disperse Red 20

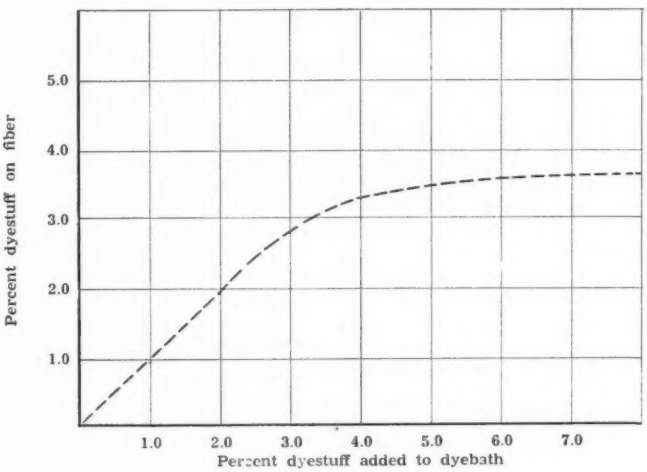


Figure 2
Acrilan 16 dyed with Eastman Fast Yellow W-GLF

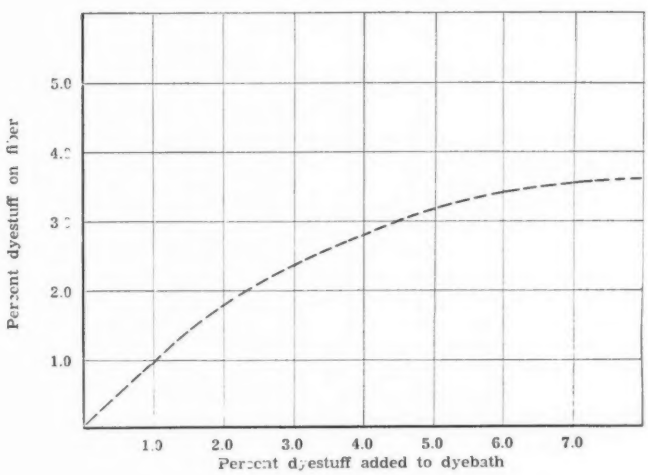


Figure 3
Acrilan 16 dyed with CI Disperse Blue 3

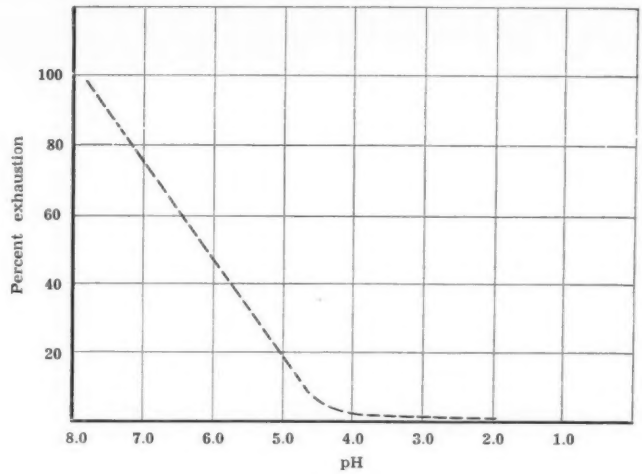


Figure 4
Acrilan acrylic fiber dyed with 1.0% CI Basic Blue 21

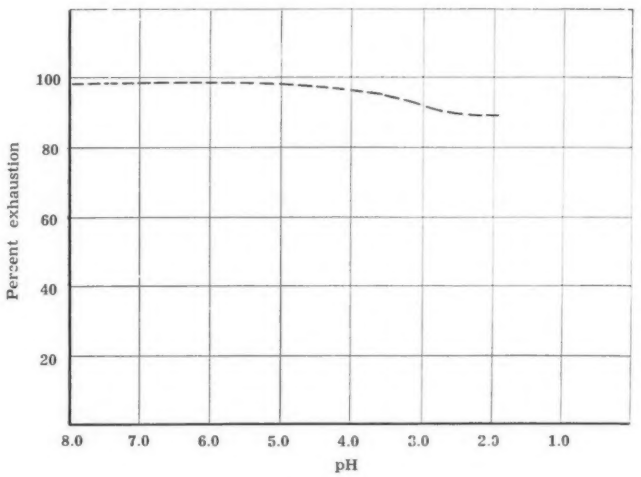


Figure 5
Acrilan 16 dyed with 1.0% CI Basic Blue 21

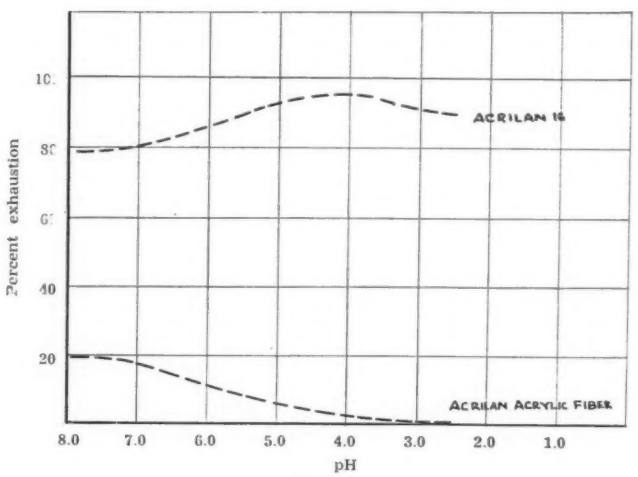


Figure 6
Acrilan 16 and Acrilan acrylic fiber dyed in a common bath with 1.0% CI Basic Blue 21

Acrilan as the pH is lowered. The effect of dyebath pH upon the exhaustion of 1.0% CI Basic Blue 21 on Acrilan is illustrated in Figure 4. Notice that the exhaustion increases from 78% at pH 7.0 to 98% at pH 7.8. On the other hand, it drops to 46% at pH 6.0 and to about 2% at pH 4.0. Simply stated, it is virtually impossible to dye Acrilan with basic dyes from a strongly acid dyebath. For this reason, we generally recommend the use of urea in the dyebath which gives a slow but progressive increase in pH from slightly acid at the beginning of dyeing to slightly alkaline in the exhausted bath. This technique must be approached with caution because there are some basic dyes that are alkaline sensitive and, therefore, not suitable for use with urea. Even under the best bath conditions basic dyes will not build up to heavy shades on Acrilan.

Acrilan 16, on the other hand, has excellent affinity for basic dyes, and can be dyed to any practical shade. As illustrated in Figure 5, the basic dyeability of Acrilan 16 is virtually unaffected by bath pH. Here again we use 1.0% CI Basic Blue 21 to demonstrate the effect of dyebath pH on exhaustion. Notice that 98% exhaustion is obtained at all pH values higher than pH 4.5. At pH 3.5 the exhaustion is 95% and at pH 2.5 the exhaustion is 90%.

When both fibers are dyed with 1.0% CI Basic Blue 21 from a common bath at pH values neutral or slightly alkaline, the Acrilan 16 absorbs 79% of the dye and the Acrilan absorbs only 19%. As the dyebath pH is lowered, the Acrilan 16 absorbs more and more of the dyestuff and the Acrilan absorbs less until at pH 3.0, the Acrilan is left undyed. (See Figure 6). Although we have illustrated this phenomenon with only a one-percent dyeing of one basic dyestuff, experience in the laboratory and in production teaches us that all basic dyestuffs behave in much the same manner. Thus, if the two fibers are dyed together with basic dyes from a neutral bath, the Acrilan 16 will dye considerably heavier than the Acrilan; and if they are dyed together from a strong acid dyebath, the Acrilan 16 component will absorb all the dyestuff, leaving the Acrilan virtually undyed. Three percent formic acid in the dyebath (at 40 to 1 volume) gives a bath pH of approximately 3.0 and is adequate to cause basic dyes to selectively dye the Acrilan 16 leaving Acrilan reserved; however, the basic dyes used must be

insensitive to strong acid. Generally speaking, those basic dyes that will withstand carbonization are suitable for application from a strong acid bath.

Unlike Acrilan, Acrilan 16 has no affinity for acid dyes; therefore, by dyeing the blend with acid dyes, the Acrilan component can be dyed, leaving the Acrilan 16 component undyed. All acid dyes have affinity for Acrilan, but regardless of their varying acid requirements for application to wool, 4.0% to 6.0% sulfuric acid is required to obtain penetration and optimum colorfastness on Acrilan. Acid dyes to be used should be carefully selected for their ability to dye Acrilan level from a strong acid bath without cross-staining Acrilan 16. Since a strong acid bath is required, it logically follows that level-dyeing acid colors and acid metalized colors offer best choice. If strong acid-dyeing colors are selected, the dye procedure shown in Table II can be used.

If weak acid dyes are selected, a different dyeing technique is recommended using a weaker acid initially to allow slow, even dye exhaustion. Sulfuric acid is subsequently added to insure maximum dyestuff penetration and colorfastness results. (See Table III).

The ideal conditions for dyeing Acrilan 16 with basic dyes leaving Acrilan clear and those for dyeing Acrilan with acid dyes are the same. Thus, when strong acid is used in the dyebath (4.0% to 6.0% sulfuric acid), basic dyes will selectively dye Acrilan 16 and acid dyes will selectively dye Acrilan. To obtain two-color cross-dye shades, or union shades on Acrilan 16/Acrilan blends, simply dye the Acrilan 16 with selected basic dyes and the Acrilan with selected acid dyes from a bath containing sulfuric acid and an antiprecipitant. A suitable method is shown in Table IV.

Peregal TW is used in the dyebath to prevent coprecipitation of acid and basic dyes. In cases where either fiber is left undyed, a nonionic surfactant or other suitable auxiliary may be substituted, if the dyer desires. Peregal TW or a similar product must be used to prevent coprecipitation of acid and basic dyes when both fibers are to be dyed. In some cases, it might be necessary to include a retarder to promote level dyeing with the basic dyes, as is usually done when dyeing 100% Acrilan 16. This creates a problem because the cationic retarders generally used are not compatible with the anionic dyes used for the Acrilan component.

TABLE II

Typical dyeing process for Acrilan with strong acid-dyeing colors

1) Set dyebath at 120°F with:
   0.5% nonionic surfactant
   6.0% sulfuric acid
   10.0% Glaubers salt (anhydrous).
2) Add previously dissolved acid dyestuff and circulate five minutes.
3) Heat to 210°F over 45-minute period, run 60 to 90 minutes and sample.
4) Make dye additions as necessary to match desired shade. Cool dyebath to 180°F for all adds.
5) When correct shade is obtained, cool dyebath to 160°F by radiation and rinse until clear.
6) Scour and neutralize at 140°F with:
   1.0% nonionic detergent
   0.5% TSP or TSPP.

TABLE III

Typical dyeing procedure for Acrilan using weak acid-dyeing colors

1) Set the dyebath at 120°F with:
   0.5% nonionic surfactant
   3.0% formic acid
   10.0% Glaubers salt (anhydrous).
2) Add previously dissolved acid dyes and run five minutes.
3) Heat to 210°F over 45-minute period and run 30 minutes.
4) Cool bath to 190°F by radiation and add 2.0% sulfuric acid.
5) Reheat to 210°F and run 30 minutes.
6) Cool bath again to 190°F by radiation and add an additional 2.0% sulfuric acid.
7) Reheat dyebath to 210°F, run 30 minutes and sample.
8) Make color additions as necessary to obtain desired shade. Cool dyebath to 180°F for all adds. To insure levelness, it is suggested that level-dyeing acid colors be employed for shading because of the high amount of sulfuric acid present in the dyebath.
9) When correct shade is obtained, cool dyebath to 160°F by radiation, and rinse until clear.
10) Scour and neutralize at 140°F with:
    1.0% nonionic detergent
    0.5% TSP or TSPP.

TABLE IV

Typical procedure for cross-dyeing Acrilan 16/Acrilan

1) Set the dyebath at 120°F with:
   1.0% Peregal TW
   6.0% sulfuric acid
   10.0% Glaubers salt (anhydrous).
2) Dissolve the basic dye component separately. Add to the dyebath and allow to circulate.
3) When the basic dyes are thoroughly circulated, add previously dissolved acid dyestuff.
4) Heat to 210°F over 45-minute period, run 60 to 90 minutes at 210°F, and sample.
5) Make color additions as necessary to match desired shade, remembering to add basic and acid dyes separately. Cool dyebath to 180°F for all color additions.
6) When correct shade is obtained, cool to 160°F by radiation and rinse until clear.
7) Scour and neutralize at 140°F with:
   1.0% nonionic detergent
   0.5% TSP or TSPP.

TABLE V

Anionic complex system for cross-dyeing Acrilan 16/Acrilan

1) Set the dyebath at 120°F with:
   1.0% Irgasol DA
   2.0% Tinegal NA
   0.3% sodium acetate
   6.0% sulfuric acid.
2) Add previously dissolved acid dyestuff. Heat to 140°F, and then add previously dissolved basic dye.
3) Heat to 210°F over 45-minute period, run 60 minutes at 210°F, and sample.
4) Make color additions as necessary to match desired shade, remembering to dissolve and add basic and acid dyes separately. Cool dyebath to 180°F for all adds.
5) When correct shade is obtained, cool bath to 160°F by radiation, rinse clear, scour, and neutralize.

The inclusion of 1.00% nonionic surfactant, such as Igepal CO-710 or Tinegal NA, will prevent coprecipitation of the cationic retarder and the anionic dyestuffs The procedure in this case is the same as regularly employed except that the Peregal TW is replaced with 1.0% nonionic surfactant and 0.5% to 1.0% cationic rearder.

The Anionic Complex System, or I-T method, as developed by Geigy Dyestuffs, is also suitable for cross-dyeing Acrilan 16/Acrilan blends. The anionic and nonionic auxiliaries employed by this system are compatible with most wool-acid-type dyes, and at the same time, act as an anti-precipitant between acid and basic dyestuffs. Perhaps one of the most outstanding features of the Anionic Complex System is that the dyebath pH is not critical, thereby allowing the dyer to employ optimum pH conditions for whatever dyes he is using. With the Anionic Complex System, the dyer can apply selected basic dyes to the Acrilan 16 and level-dyeing acid colors to the Acrilan from a bath containing 6.0% sulfuric acid. This enables him to take advantage of the retarding and leveling action of the Anionic Complex System on basic dyes without interference to the application of level-dyeing strong acid colors. The dyeing procedure with the Anionic Complex System is shown in Table V.

Regardless of the method selected for cross-dyeing Acrilan 16 and Acrilan, if weak acid dyes are selected, they should be combined with other weak acid colors having similar exhaustion characteristics, and the dyeing should be started out with 3.0% formic acid instead of the usual 6.0% sulfuric acid. Then add 4.0% sulfuric acid in two equal portions, 30 minutes after reaching dyeing temperatures.

In producing cross-dye effects, it is suggested that the Acrilan component be dyed to the heavier shade, with the Acrilan 16 left white or dyed to the lighter, brighter shade. This is the logical choice from a standpoint of both color and economy. Acrilan 16 has a cleaner, whiter, natural color and is dyed with basic dyes which are brighter and have the best lightfastness. On the other hand, the acid dyes used for the Acrilan component are less expensive. Also, when dyeing heavy shades, selected acid dyes will cross-stain Acrilan 16 much less than basic dyes will cross-stain Acrilan. When attempting to dye full shades on Acrilan 16 leaving Acrilan white, invariably the Acrilan com-

ponent becomes stained. With 3.0% formic acid, less cross-staining takes place than when stronger acid dyebaths are used.

SUMMARY

In summation, it can be pointed out that, although Chemstrand's new acrylic fiber, Acrilan 16, has basic physical properties that are very similar to the older, better-known Acrilan acrylic fiber, the dyeing properties are very dissimilar. Acrilan is dyeable to a complete range of shades with disperse dyes; however, disperse dyes build to only medium heavy shades on Acrilan 16 and are not practical for shades requiring more than a total of 4.0% dyestuff. The colorfastness of acetate dyes on Acrilan 16 is superior to their colorfastness on Acrilan. Basic dyes have a faster dye rate on Acrilan 16 than on Acrilan and some system of retarding the dye rate is required to insure level dyeing. Basic dyes will produce a full range of shades on Acrilan 16, whereas they do not satisfactorily build above medium heavy depth on Acrilan. Acid dyestuffs have no affinity whatsoever for Acrilan 16, whereas they dye Acrilan readily from a strong acid bath. By taking advantage of these differences in dyeing characteristics, a simple technique has been worked out whereby blends of acrylic fibers can be cross-dyed into an almost limitless range of two-color combinations from a single bath. This technique employs selected basic dyes for the Acrilan 16 component and selected acid dyes for the Acrilan. These are applied from a strong acid bath containing an agent or system to prevent coprecipitation between acid and basic dyes.

ACKNOWLEDGMENT

The author wishes to acknowledge with appreciation the able assistance of Melvin R Nipe of the Chemstrand Corporation, who was very helpful in accumulating the data presented in this paper.

TRADEMARKS

The following product names, which have been used in this paper, are registered trademarks: Acrilan (The Chemstrand Corp); Textone (Olin Mathieson Chemical Corp); Uvitex (Ciba Co, Inc); Irgasol (Geigy Dyestuffs); Tinegal (Geigy Dyestuffs); Peregal (General Dyestuff Co); and Igepal (General Dyestuff Co).

REFERENCE

(1) Leddy, J A, *Am Dyestuff Reptr* 49, No. 8, P272-84 (April 18, 1960)

Chemical Principles of Dyeing and Finishing———

(*concluded from page 36*)

out undergoing chemical reaction to form covalent bonds. Generally, the choice of materials to be used with reactive dyes is the same as for anionic dyes with the added proviso that materials that can react with the dye be excluded.

Direct dyes make up a special class of anionic dyes with direct affinity for cellulose. Figure 18 gives the structure of a direct yellow. These dyes are adsorbed on cellulose and do not depend upon anion-cation attraction for their affinity. The main function of the sulfonate groups is to make the dye soluble in water. Solubility, although convenient, poses a problem in that some of the dye tends to remain in the dyebath in preference to the fiber. For this reason, common salt or sodium sulfate is frequently used to encourage exhaustion. These salts act by supplying excess sodium ions over those produced by ionization of the dye. According to the law of mass action, an increase in the concentration of sodium ions in the dyebath necessitates a reduction of the concentration of the dye ions to maintain equilibrium. Since the dye ions can leave the dyebath only by entering the fiber, the net effect is to improve exhaustion.

Direct dyes are easily removed from cellulosic fibers by water, and, for this reason, are often fixed by aftertreatment with cationic agents, which form insoluble complexes with the sulfonate groups. These cationic agents, called dye fixatives, are usually applied in combination with resins to improve the dimensional stability of the fabric.

CONCLUSION

Naturally, there remains a large number of textile treating agents that have not been discussed. The general principles by which they operate are the same as those that have been illustrated, however. Application of the principles outlined in this paper should permit a qualitative prediction of the function of any dye or textile chemical.

AATCC Deceased

Member	*Section*
STEPHEN I RUDO Werner Textile Consultants	Met
WALTER J SULLIVAN E I duPont de Nemours & Co, Inc	NNE
JOHN M SCANLAN	MW
JAMES J KELLEY Amerbelle Corp	WNE
ALEX W ENGBLOM Alex Engblom & Co AB	—

(Photo by Kenneth C Everett)

Edwin J Grajeck (left) and Carlo DeMarco, speakers at March 25th meeting of the Rhode Island Section. (See report on page 70 of April 18 issue).

Northern New England

ROBERT D Robinson, chairman, Northern New England Section, has announced the following committee appointments:

Budget—Edward J McNamara Jr, Hamilton Chemical Co

Speakers Program—Edward J McNamara Jr

Dining—John R Markgren, W C Durfee Co, Inc

Publicity—Laurence E Rossiter, Nopco Chemical Co

Intersectional Contest Paper '60—Bennett S Gesmer, Dyecraftsmen, Inc

Annual Outing—John R Markgren; Donald H Thomas, National Aniline Div

Hospitality—Fritz F Kobayashi, Lowell Technological Institute

Properties—Bennett S Gesmer

Student Chapter—Robert D Robinson, Bachmann Uxbridge Co

Bylaws—John P Ploubides, Hamilton Chemical Co

Archives—Ernest R Kaswell, Fabric Research Labs, Inc

Auditing—Daniel P Collins, The Derby Co

Corporate Membership — Morris Campbell, QM Research & Development Command

Northern New England Section Meeting of March 18, 1960
Colonial Club, Lynnfield, Mass

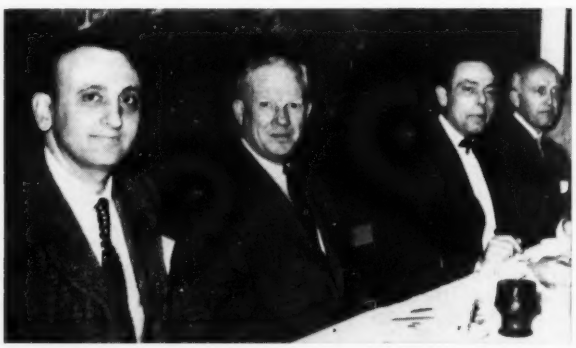
(*See report on page 71 of April 18 issue*)

(Photos by L E Rossiter, Nopco Chemical Co)

O C Holland demonstrates extremes of color and design used in headdress

Group attending NNE Section meeting shows amused reaction to O C Holland's talk on "Color Magic"

Three of the newly appointed NNE committee chairmen: l to r, Donald H Thomas, outing; John R Markgren, outing and dining; Daniel P Collins, auditing



HEAD TABLE AT NNE MEETING OF MARCH 18—L to r: Bennet S Gesmer, sectional committeeman; William W Pennock, treasurer; O C Holland, guest speaker; Robert D Robinson, chairman

O C Holland illustrates basic principle of the prism in prelude to talk on "Color Magic"

Photo taken from opposite end of head table shows (l to r) Messrs Pennock, Holland and Robinson; Edward J MacNamara, program chairman; and Geo O Linberg, past president, AATCC

Piedmont

AT a recent officers meeting of the Piedmont Section, several items of interest were acted upon. By a unanimous vote, it was decided to increase the two Charles H Stone Scholarship Awards for the year 1960-1961 from $250.00 to $500.00. These awards are made each year to rising seniors at N C State College and Clemson College. It was the feeling of the Section's governing board that rising costs of tuition, fees and books required such an increase to make the Award of practical value.

At the same meeting, letters from the *Charlotte Observer* and *Charlotte News* expressed appreciation of the Piedmont Section's active sponsorship and contribution to the local Science Fair. At the officers' meeting in January, 1960 the Governing Board authorized the contribution of $25.00 to such science fairs in the Section's geographical region that are sending their winners directly to the National Science Fair, upon their application for such support.

A headquarters lounge has been arranged at Convention Hall, Room 8, in Atlantic City for members of AATCC attending the American Textile Machinery Exhibition-International on Wednesday, May 25, 1960.

Western New England Section Meeting of March 11, 1960
Rapp's Restaurant, Shelton, Conn

HEAD TABLE (L to r): Henry C Speel, secretary; Walter H Hindle, guest speaker; Albert H Rant, chairman, Timothy J Horan, vice chairman.

Chairman Rant greets Secretary Speel. (Mr Speel has since left the Section to take up new duties in Ohio).

Vasil J Pappas, sectional committeeman, poses with Walter C Hindle, guest speaker, who discussed "Polyvinyl Alcohol Fibers".

Mid-West Section Meeting of February 6, 1960 • Bismarck Hotel, Chicago, Ill

HEAD TABLE—L to r: A J Andrews, secretary; J A Leddy, afternoon speaker; J L McGowan, chairman; Carl S Winters, evening speaker; F S Stover, vice chairman; J E Miller, treasurer

Elected to Membership

April 7, 1960

No designation after name indicates Senior
(A) indicates Associate
(J) indicates Junior
(S) indicates Student
*indicates transfer from another class of membership

NEW ENGLAND REGION

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Robert Rodgers
Raymond J Terrio
*Morris N Hahn**

Western New England Section

Ronald J Zolla

Rhode Island Section

Michael A Silvestri
Gerhard E Sprenger
Raymond V Kusiak (J)

CENTRAL ATLANTIC REGION

Metropolitan Section

Raymond L Rodin
Martha A Park (A)
*Ashok M Patel**

Hudson-Mohawk Section

John S Sweet

Delaware Valley Section

Edgar H Walls
*Richard H Brehm III**

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Claude S Hughey
Chauncey L Martin
Jeremiah W Weaver
Edward B Baldwin Jr (J)
Bobby Ford (J)
Peter A Moretti (J)
Samuel G Parler (J)
Dennis E Pike (J)
Earl M Moses (A)
*James E Lonon Jr**
*Willie L Hodge**

Southeastern Section

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Jay B Sales (J)

WESTERN REGION

Mid-West Section

Frank R Kappler
Don T Ho (A)
June C Wilbur (A)
Sidney L Withrow (A)

Pacific Southwest Section

*Eugene Kim**

STUDENT CHAPTER

Georgia Institute of Technology

Thomas H Banks (S)
James H Currey (S)
James L Urquhart (S)

NON-AFFILIATED

Frank J Deegan

•

April 21, 1960

NEW ENGLAND REGION

Northern New England Section

Donald E Robinson

Rhode Island Section

Thomas F Joyce

CENTRAL ATLANTIC REGION

Metropolitan Section

Charles E Cooper
Erhard A Zwingert
Raymond Bertani (J)
Ronald H Mitchell (J)

Delaware Valley Section

Charles E Zortman (J)

SOUTHERN REGION

Piedmont Section

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Walter T Holliday
*Rufus P Anthony**
*Jack A Dayvault**
*Billy R Ezzell**
*Dennis B Faw**
*Wayne H Lawson**

South Central Section

Carl L Cochrane
Dan J Criswell
Robert E Maher

Southeastern Section

Ben H Jackson
Monroe C Ludewig

WESTERN REGION

Mid-West Section

Albert E Scharfetter
Janice E Cunningham (S)
Melba G Shilling (S)

STUDENT CHAPTER

Clemson College

Jerry S Byrd Jr (S)
Bobby L Neal (S)
Francis A Townsend Jr (S)

AATCC Calendar

COUNCIL, COUNCIL COMMITTEES, RESEARCH COMMITTEES
May 26-27 (Hotel Sheraton-Atlantic, New York, NY); May 26—Council Committees and Research Committees; May 27 (AM)—ECR, TCR; May 27 (PM)—Council
Sept 8-9 (Atlanta, Ga); Sept 8—Council Committees and Research Committees; Sept 9 (AM)—ECR, TCR; Sept 9 (PM)—Council

NATIONAL CONVENTIONS
Oct 6-8, 1960 (Sheraton Hotel, Philadelphia, Pa); Sept 28-30, 1961 (Buffalo, NY); 1962 (Southern Region)

DELAWARE VALLEY SECTION
May 20 (Outing, North Hills CC, North Hills, Pa); Sept 16 (Reading, Pa); Nov 4, Dec 9 (Philadelphia, Pa)

HUDSON-MOHAWK SECTION
May 20 (Ladies Night); June 24 (Annual Outing)

METROPOLITAN SECTION
May 20 (Ladies Night—Swiss Chalet); June 17 (Outing—North Jersey Country Club, Wayne, NJ)

MID-WEST SECTION
June 18 (Outing, Cerami's Island View Resort on Browns Lake, Burlington, Wis)

NORTHERN NEW ENGLAND SECTION
May 13 (Lowell Tech Inst, Lowell Mass); Sept 9 (Outing—Wachusett Country Club, West Boylston, Mass); Oct 21 (Hotel 128, Dedham, Mass—"Customer Service"—Arthur Swenson, J P Stevens & Co, Inc, and P J Fynn, J C Penney Co); Dec 9 (Colonial Country Club, Lynnfield, Mass—"Present-day Economic Outlook in Textiles"—William I Kent, Kent Mfg Co); Jan 20 (Hotel 128, Dedham, Mass—Symposium on "Mechanical and Chemical Finishing of Textile Fabrics"—John J McDonald, Lowell Technological Inst, D D Gagliardi, Gagliardi Research Corp, and Werner von Vergen, J P Stevens & Co, Inc)

PACIFIC SOUTHWEST SECTION
May 13 (Rodger Young Auditorium, Los Angeles, Calif); July 16 (picnic); Sept 24-25 (Outing—Apple Valley, Calif); Nov 18 (Rodger Young Auditorium, Los Angeles, Calif); Dec 10 (dance)

PIEDMONT SECTION
June 3-4 (Outing—Ocean Forest Hotel, Myrtle Beach, SC); Sept 23-24 (Hotel Charlotte, Charlotte, NC)

RHODE ISLAND SECTION
June 24 (Outing—Metacomet Country Club); Sept 23 (Management Night); Oct 28 (Providence Engineering Society); Dec 2 (Annual Meeting—Johnson's Hummocks)

SOUTH CENTRAL SECTION
May 13-14 (Outing—Riverside Hotel, Gatlinburg, Tenn); Sept 17, Dec 9 (Hotel Patten, Chattanooga, Tenn)

SOUTHEASTERN SECTION
June 10-12 (Outing—Radium Springs Lodge, Radium Springs, Ga); Sept 10, Dec 3 (Atlanta Athletic Club, Atlanta, Ga)

WESTERN NEW ENGLAND SECTION
May 6 (Ladies Night, Rapp's Paradise Inn, Ansonia, Conn); June 10 (Outing, Wallingford Country Club—tentative); Sept 23 (Blake's Restaurant, Springfield, Mass); Oct 21 (Annual Meeting, Rapp's Restaurant, Shelton, Conn); Dec 2 (Rapp's Restaurant, Shelton, Conn)

ADVERTISEMENT NO. 70 OF A SERIES

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Cyanamid's Shark Chasing Chemicals Now Available For Civilian Use

An effective shark repellent, developed during World War II by American Cyanamid Company in cooperation with the Naval Research Laboratory and used as standard equipment by several branches of our armed services, was recently cleared for sale to skin-divers and other civilians concerned with protecting themselves against sharks at sea.

The shark chaser is a combination of a special black dye and an odorous chemical salt offensive to sharks but not to humans. Extensive experimentation had shown that sharks avoid dark objects and dark areas, hence the black dye; it was also observed that sharks avoided areas where dead, decomposing sharks were found in the water. After isolating the odorous chemical factor in dead sharks which other sharks found offensive, the problem was to (1) combine the black dye and the chemical in one product (2) control solubility and diffusion rate in salt water (3) develop a simple, lightweight package which could be attached to a life preserver, and which could be easily opened, diffused and saved for repeat use if necessary.

The small shark chaser chemical packs now rank with parachutes and other safety devices men count on for physical safety and psychological comfort. Available through marine supply stores, these packets, manufactured by Presto Marine Supply Company, Yonkers, New York, are in increasing demand by fishermen, skin-divers, boating enthusiasts, and others who have no desire to tangle with a shark.

American Cyanamid is still the sole producer of the shark chaser chemicals.

Calcosperse Dyes For Polyester Fibers: A New Name In Synthetics Dyeing Field

With the rising popularity of polyester fibers in the textile trade, Cyanamid's announcement of a selected line of disperse dyes which meet the special requirements of this fiber is welcome news indeed.

Of prime importance, Calcosperse dyes are applied by current standard methods. They dye readily in procedures calling for the use of carriers at normal dyeing temperatures or at higher temperatures in pressure apparatus without carriers.

Results indicate that these dyes received special attention from the point of view of practical production. Level dyeings are consistently achieved with a minimum of processing, and with no more than normal attention from the dyer. The special problem of *stability* in high temperature processes also has been successfully solved.

Fastness properties of Calcosperse dyes amply satisfy the requirements of fabrics composed partly or wholly of polyester fibers. These dyes are carefully manufactured to maintain high standards of fastness to light, washing, dry cleaning, perspiration, hot pressing, atmospheric fading, and crocking.

A broad range of shades enables the dyer to reach virtually any desired shade. Currently available:

Calcosperse	Yellow GL
Calcosperse	Yellow 4RL
Calcosperse	Brilliant Orange 2R
Calcosperse	Orange 3RD
Calcosperse	Scarlet 2G
Calcosperse	Red B
Calcosperse	Red 2R
Calcosperse	Blue B
Calcosperse	Violet B

Full details from Cyanamid Sales Representative on request. Specific recommendations for problems arising out of individual plant conditions are available from a highly competent Technical Service staff.

Calcoloid Olive TL Single Paste Assures Level Dyeing By Pad Steam

Among the many improvements incorporated in Cyanamid's Calcoloid Olive TL Single Paste, its level dyeing properties for pad steam work are particularly welcome. These level dyeing results are obtained without the use of special chemicals, gums or intricate infrared dyeing apparatus. Calcoloid Olive TL Single Paste also meets the most exacting filtration tests, and is recommended for package dyeing and other standard procedures.

Unexcelled working properties, excellent coverage, and top fastness ratings make it a highly satisfactory shading color for olive greens and khakis—the current and coming colors for twills, poplins, sateens—all cotton and rayon fabrics for slacks, suits, shirts, work clothes, outdoor wear.

Since this dye is a CPS type (Controlled Particle Size), dyers enjoy the easy dispersion, uniformity, nonspecking, and other superior properties which distinguish Cyanamid's CPS quality vat dyes.

An outstanding result of Cyanamid's continuing dye research and development program, Calcoloid Olive TL Single Paste is the precursor of other improved dyes to come from Cyanamid Laboratories.

The following ratings give an indication of its all-around quality:

Fastness Properties

Light	
Light Shade	7 to 8
Medium Shade	8
Heavy Shade	8
AATCC Cotton Washing	
Test No. 3	5
Test No. 4	4 to 5
Boiling Soap and Soda	4 to 5
Chlorine (0.3% available)	4 to 5
Peroxide	4 to 5
Perspiration	5
Dry Cleaning Stoddard's Solvent	5
Artificial light	
Shade Change—Greener	
Cross Dyeing	
Acetic	5
Sulfuric	5
Top Chrome	5
Fulling AATCC	
Test No. 3-5	
Stoving	5
Open Kier Boil	5
Mercerizing	5

Trial samples and technical data on request.

News of the Trade

GRC Textiles Program Announced

The program for the annual Gordan Research Conference on Textiles, to be held this year at Colby Junior College, New London, NH, July 11-15, has been announced by W George Parks, director.

Fred Fortess, Celanese Corp of America, will serve as chairman. He will be assisted by Howard J White, Textile Research Institute, who will act as vice chairman.

The program is as follows:

July 11—"Wet Spun Acrylic Fiber Structure and Physical Properties as a Function of Coagulatiion System" — A B Craig; "Structure and Properties of Polyamide Fibers"—W F McDevit.

July 12—"Molecular Motion in Polyethylene Terephthalate and Related Polymers"—Ian Ward; 2nd paper by C H Bamford.

July 13—"The Mechanism of Dyeing Polyamide Fibers"—H Zollinger; "New Methods of Modification of Cellulose Fiber Properties"—Z A Rogowin.

July 14—"Different Behavior of Cotton, Modified Cotton and Rayon in New Cross-linking Reactions"—D D Gagliardi; "Effect of Chemical Treatment Upon the Stress-Strain Properties of Selected Cotton Fiber Types"—Ludwig Rebenfeld.

July 15—"The Relationship of Fiber and Fabric Properties to 'Wash-and-Wear' Performance of Poly Fibers"—C E Reese.

Requests for attendance at the Conference, or additional information, should be addressed to W George Parks, director, Dept of Chemistry, Univ of Rhode Island, Kingston, RI.

•

Standard International Buys Adell Chemical

Jacob L Barowsky, president and founder of the Adell Chemical Co, Inc, has signed an agreement to sell the Holyoke, Mass, firm, which makes Lestoil liquid detergents and Lestare dry bleach, to the Standard International Corp of Andover, Mass. Included in the agreement are Adell Chemical Co, Inc, the parent company; Lestoil, Inc; Lestoil, Ltd of Canada; Jackson Associates, the advertising agency of the company; and the JLB Realty Trust. The sale price was not disclosed.

John Bolten Sr, chairman of the board of Standard International, and Daniel E Hogan Jr, president of Standard International, signed an agreement to purchase for the new owners, while Mr Barowsky signed the agreement for himself and his family, the only stockholders of the Adell firm.

Mr Barowsky will continue in the active management of the company and serve as chairman of the board of directors. I L Eskenasy and Aaron L Kingsberg will also continue in major executive capacities with the Company.

The decision to sell the company, which in the short span of six years has skyrocketed from a $90 thousand a year business to $24 million a year, was two-fold— (1) the tax situation, and (2) the new owners' assurance that Adell's policy as regards personnel, management, product promotion and participation in Holyoke community affairs would be maintained.

•

USTC Forms Textile Standards Advisory Board

H M Block, vice president, United States Testing Company, Inc, has announced the formation of a Textile Standards Committee, composed of textile engineers and chemists, which will function as an advisory board to representatives of the producing, manufacturing, and retailing segments of the textile industry.

Mr Block said, "Since the Testing Company, as the representative of the American Council of Independent Laboratories, was active in the preparation of the American Standards Association L22, Minimum Performance Standards for Textiles, and in view of the Company's position as an impartial and independent laboratory, it is most appropriate that this service be made available to representatives of the textile industry."

"This Committee," Mr Block went on to say, "is available to discuss the workings and provisions of L22. The Testing Company has had years of experience in testing and evaluating fabrics used for both apparel and home furnishings."

•

Chemical Sales Co Appointed Antara Distributor

The appointment of The Chemical Sales Co, 1125 Seventh St, Denver 4, Colo, as distributor for Antara Chemicals, a sales division of General Aniline & Film Corp, New York, was announced recently.

The Denver firm will handle distribution of Antara's line of surfactants, sequestering agents, iodophors, glycols and other products and will provide truck delivery in the metropolitan-Denver area direct from The Chemical Sales Co warehouse.

•

New Department at NC State

A Department of Textile Technology has been established in the School of Textiles at North Carolina State College.

Malcolm E Campbell, dean o fthe School of Textiles, said the department was created through the merger of the Department of Fiber and Yarn Technology and the Department of Fabric Development.

Prof E B Grover, who is the Abel C Lineberger professor of textiles and who has headed the Department of Fiber and Yarn Technology, has been named by Dean Campbell as the head of this new Department of Textile Technology.

Two scholarships, each valued at $500 annually, have been established in the School of Textiles at North Carolina State College by Erwin Mills, Inc, of Durham, NC.

•

GAF D&C Division Holds 25-Year Club Meeting

The 25-year Club of the Dyestuff and Chemcial Division, General Aniline & Film Corp, New York, held its annual meeting on February 26 at the Savoy-Hilton Hotel.

The Club has a current membership of 129 men and women, active as well as retired, who have worked for the company for 25 years or more.

The meeting this year consisted of a reception, a dinner, the annual business meeting, induction of seven new members and an address by Philip M Dinkins, president, General Aniline & Film Corp and by Harold G Shelton, manager of the Division.

Edward R Heintz, manager, Dyestuff Industry Sales, New York, who presided at the meeting, has been succeeded as president by F Vagts of the Chicago Laboratory.

The Club was founded in 1931, and in addition to this annual get-together, each member receives a diamond-studded lapel pin upon reaching eligibility for membership.

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Niagara Twist-Setter: *Yarn Conditioning Penetrants.*

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Headquarters for textile chemicals

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Staab

Putnam Chemical Corp has announced the appointment of *E H Staab* as Mid-Atlantic sales manager, including the states of New Jersey, Pennsylvania, New York, Maryland, Delaware, Northern Virginia, Eastern Ohio, and Western Connecticut.

Mr Staab has been a sales representative for Putnam for many years. Prior to his association with Putnam, he was a technical sales representative for National Aniline Div.

Mr Staab's headquarters will be in Ridgefield Park, NJ.

•

B R Celantano has been named Verona Dyestuffs' representative in the eastern half of North Carolina.

Formerly a member of Verona's Technical Department, Mr Celantano has had many years of practical experience in the application of dyestuffs with special emphasis on naphthols and vats.

•

Arthur F Brown has been elected a member of the board of directors of Hercules Powder Company.

Mr Brown, who has been president of Imperial Color Chemical & Paper Corp since 1953, will be general manager of Hercules' eighth operating department, to be known as the Imperial Color Chemical & Paper Department.

•

Radiation Counter Laboratories, Inc, manufacturers of nuclear gauges and nuclear data processing equipment, has announced the appointment of *John E Murdock Jr* as technical representative for the Southeastern United States.

Murdock, formerly chief textile technician for the U S Quartermaster Corps, has studied the durability of clothing used by the U S Armed Forces throughout the world. He has developed several patents for determining the dimensional stability of flexible clothing and a beta gauge, now manufactured by RCL, which reportedly can determine the durability of any textile material.

Catalin Corporation of America has named *Howard Wood* as a sales engineer in its Resins Division.

Mr Wood will operate from Catalin's New York headquarters covering parts of the New England and Middle Atlantic states. He had previous experience selling fats and edible oils.

•

Harry B Warner, with The B F Goodrich Company since 1939, became president of B F Goodrich Chemical Company, a division, on May 1.

Warner succeeds *John R Hoover,* president of BFG Chemical Co since 1951, who retired April 30 after 35 years with the company.

Warner, who had been vice president, marketing of BFG Chemical, had also served as vice president, development and in various manufacturing, engineering and field assignments in the United States and overseas.

Thomas B Nantz, formerly vice president, manufacturing succeeds Warner as vice president, marketing, and *Robert D Scott,* previously vice president, development, has become vice president, manufacturing and development.

•

Morton Chemical Company has named *Frank K Hoover* to be Chicago District sales manager for industrial chemicals. He fills the position formerly held by *Wayne Micheel,* who recently became product manager for organic chemicals.

As Chicago District Sales Manager, Hoover will supervise the Morton Chemical sales force in nine midwestern states.

•

S L Karpeles, vice president of Imperial Color Chemical and Paper Corp, Glens Falls, NY, retired March 31st after 38 years in the chemical pigment color industry.

Mr Karpeles started his employment with Imperial in 1935 as director of technical sales. In 1948 he became general manager of the pigment color divisions and the chemical division of Imperial, and also a director of the Company—positions he has held until his retirement.

•

Nuodex Products Co, Division of Heyden Newport Chemical Corp, Elizabeth, NJ, has announced the appointment of *Frank X Ritter* as regional sales manager, Central Region and *William C Seymour* as regional sales representatives in their respective areas.

Sindewald

Walter Sindewald has been appointed derivatives sales representative for the Armour Industrial Chemical Company in Indiana, western Michigan, western Ohio and the south side of Chicago.

Mr Sindewald previously was responsible for sales in the Philadelphia area. In his new post, he will headquarter in Chicago.

•

T H Risch has been named field sales manager, and *G T Roberts* a product sales manager, for the Heyden Chemical Division of Heyden Newport Chemical Corp.

Mr Risch, formerly product sales manager for organic intermediate chemicals, will be responsible for the division's ten district sales offices. Mr Roberts has been the assistant group leader of the Corporation's Applications Research Group. His new responsibility will cover the sales of synthetic resin chemicals.

•

General Latex & Chemicals (Canada) Limited has announced the appointment of *F R Perego* as general manager of the Brampton, Ontario plant operations.

Mr Perego has been with the company for over eleven years, the last four years of which have been spent in Brampton in charge of all technical details.

•

Frank S Turek has been named works manager of Wilson Organic Chemicals, Inc, a subsidiary of Century Chemical Corp.

Mr Turek is a specialist of many years experience in the field of dyes and organic pigments. In his new post, he will be in charge of the manufacture of these materials at the Sayreville plant. He will also act as a technical service consultant to Century's dyes and pigments customers. Mr Turek will report directly to *William O Bleese,* vice president in charge of manufacturing.

Appointed as of April 1, Mr Turek was formerly manager of the Utility-Siemon Color Corp.

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Peeramine Fast Yellow NNL
Peeramine Fast Yellow RLC
Stilbene Yellow GA
Stilbene Yellow 3GA
Peeramine Diazo Yellow 2G
Peeracid Light Yellow 3G
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Peerachrome Yellow 2G
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Sprock

As a market development representative for B F Goodrich Chemical Co, *Howard M Sprock Jr* will render market development and technical service to textile firms in the Southeast. BFG Chemical Co's textile chemical products include Geon vinyl chloride resins and latices and vinyl acetate latex, Hycar acrylic and nitrile latices, and Good-rite Carbopol hydrophilic polymers.

Prior to joining Goodrich in 1959, Mr Sprock was with Geigy Dyestuffs.

●

Wendell D Ray has been named an industrial sales manager of the A E Staley Mfg Co. For the past two years he has been branch manager of the company's Boston office.

George M Donelan, who has been assistant manager of the company's Cleveland office for the past three years, will succeed Mr Ray as manager at Boston.

New assistant branch managers have been named on Cleveland and St Louis.

Donald M Baldwin, since 1955 a senior industrial salesman in the Kansas City territory, has been named to the St Louis post, and *Alfred W Brunlieb*, since 1952 an industrial salesman for the Milwaukee territory, has been named to the Cleveland post.

●

Ralph H Potts, Armour and Company chemical engineer who developed the first commercial plant for production of nitriles and amines from fatty acids, has been awarded the Alton E Bailey medal by the North Central Section, American Oil Chemists Society.

The award was presented at a dinner in the Builders Club in Chicago March 23. Established by the society for outstanding contributions in the field of fat and oil technology, the award is named in honor of Alton E Bailey, a former AOCS president and noted research scientist.

Mr Potts, who has been with Armour since 1923, is now technical advisor to *M E Lewis*, general manager of the Armour Industrial Chemical Co.

Nelson S Knaggs, vice president in charge of sales, The Hilton-Davis Chemical Co Division of Sterling Drug Inc, has been reelected a vice president of the Cincinnati Museum of Nautral History.

It is the fourth time Mr Knaggs has been named to a one-year term as a Museum vice president. He is also on the board of directors of the renowned Explorers' Club. The February issue of *Explorers' Club Journal* features an article by Mr Knaggs which traces the origin of the game of basketball to the ancient Mayans, and describes how the sport was played.

Mr Knaggs is a noted explorer and photographer. He has made a number of expeditions into the jungles of Central America and to the Amazon in South America. His latest trip was to Nepal, the kingdom at the foothills of the Himalayas.

●

The Association of the Customs Bar last month took occasion on his 75th birthday to salute attorney *Albert MacC Barnes*, who has been its president since 1936, and who is one of the original Organization Committee of 1917. The salute was in the form of a banquet at the Waldorf Astoria Hotel in New York.

Mr Barnes is senior partner in the law firm of Barnes, Richardson and Colburn, which represents SOCMA and the Dry Color Manufacturers Association.

●

Benjamin F Vander Poel, consultant on contributions for the Union Carbide & Chemical Corp, is serving as chairman of the Chemical Division for the American Red Cross in Greater New York.

In his Red Cross capacity, Mr Vander Poel will seek gifts in the manufacturers, dyestuffs, plastics, soaps and adhesives fields in the chemical industry.

The American Red Cross in Greater New York is seeking $5,500,000 to carry on its services during the next twelve months. The Red Cross campaign began March 1.

●

Warwick Chemical Div, Sun Chemical Corp, has announced that *George Stead Jr* has joined the Company in the capacity of textile chemist in Warwick's Rhode Island Application Laboratory.

Previously, Mr Stead was a textile chemist with Mohasco Industries, a division of the Mohawk Carpet Company, and chief chemist at Standard Laboratories.

Stettler

Colton Chemical Co, a division of Air Reduction Co, Inc, has appointed *David M Stettler* to a new sales office in New York.

Now responsible for sales and service on national accounts in the metropolitan New York and New England areas, Stettler has been assigned to a new Colton Chemical office at 150 East 42nd Street. Stettler's appointment extends the division's marketing program in the New York area, supplementing sales and service for local accounts by Seaboard Chemical Co, 198 Broadway, sales representatives.

Stettler is the former manager of the Chicago office of Colton Chemical.

●

Appointment of *George T Wingate* as senior sales representative to the Chemical Division of The Goodyear Tire & Rubber Co has been announced.

He will be assigned to the division's Philadelphia district but will cover primarily the Washington and Baltimore areas for the division's line of synthetic rubbers, latices, plastics and chemicals.

Prior to joining Goodyear, Wingate was associated with a leading heel and sole manufacturer as purchasing agent.

●

Desmond M C Reilly, chemical advertising and publicity manager, Food Machinery and Chemical Corp, has been named president of the National University of Ireland Club of New York.

Dr Reilly received his Ph D degree in chemistry from the National University of Ireland in 1945. He joined FMC in 1953 in a technical writing capacity. He has since worked with various Chemical Divisions of FMC in advertising, publicity and product promotional assignments.

●

Bruce D Henderson has been named vice president in charge of the Management Services Division of Arthur D Little, Inc. He will be responsible for the business services of this industrial research company and for its Zurich, Switzerland, branch operations.

New SANDOZ Foron® dyes up-grade fastness on polyester fibers

For an outstanding improvement in color fastness on polyester fibers, try the new SANDOZ Foron ultra-disperse dyes. Popular shades on these fibers can be matched now with available Foron dyes, and new dyes are being added rapidly.

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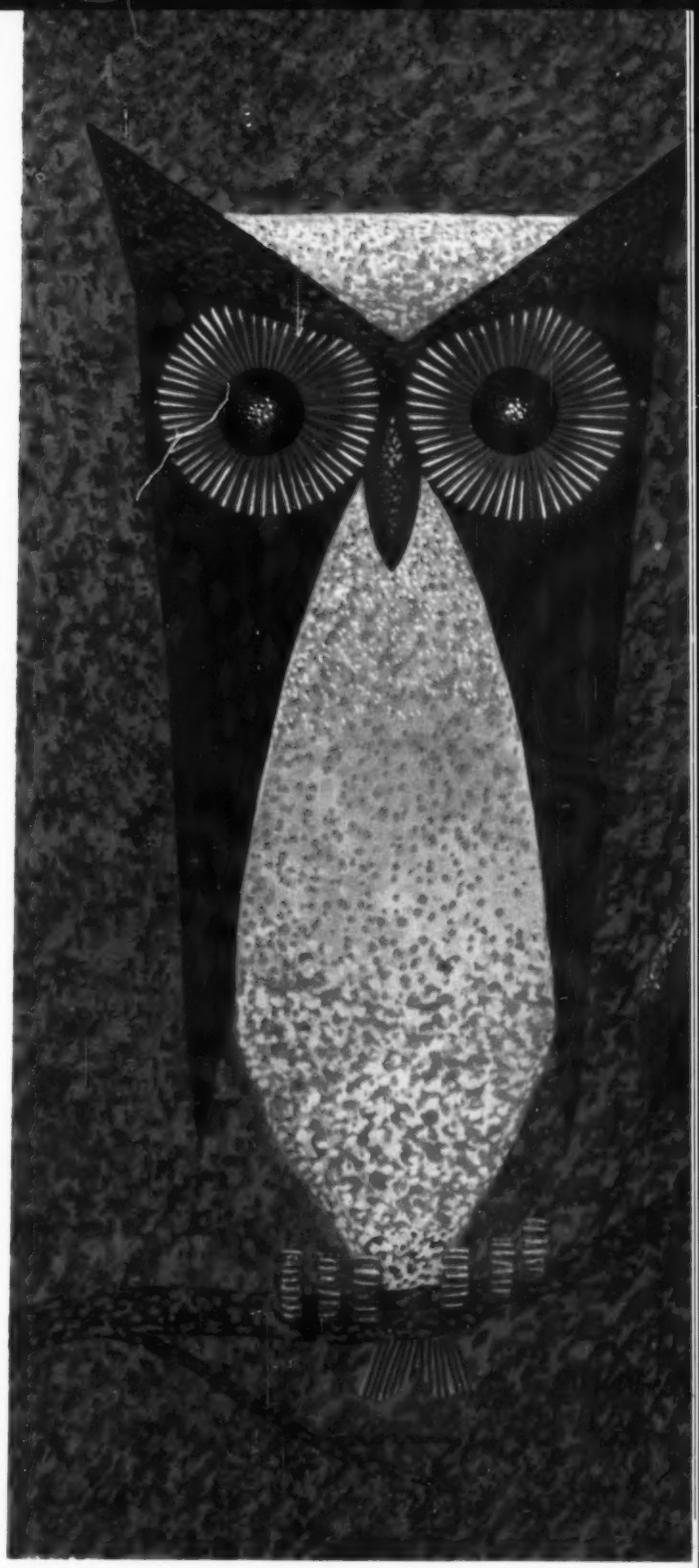

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NEW PRODUCTS, DEVELOPMENTS, PROCESSES

Drimarene-Y Reactive Dyes for Pad Dyeing Cellulosic Fibers

Following recent introduction of Drimarene-Z fiber-reactive dyes for printing cellulosic fibers, Sandoz, Inc, has announced a further range, the Drimarene-Y brands, for application by padding processes. Sandoz, Inc reports that these new reactive dyes for padding, besides the distinctive properties of the reactive class, offer six special technical advantages.

1) Excellent stability of the padding liquor, combined with high solubility of the dyestuff, means that a substantial volume of feeding liquor can be prepared at one time, so that padding can be continued over long periods from a single bath.

2) The danger of tailing is virtually eliminated, since the time of immersion and the padding temperature have no influence on the dyeing owing to the low substantivity of the dyes.

3) Migration effects do not arise when care is taken to obtain even intermediate drying.

4) Good stability to steam and heat permits economical fixation by the one-bath steam or dry heat processes.

5) Complete and easy removal of the unfixed portion of dyestuff by washing, by no means an easy matter with all reactive dyestuffs, makes this step as simple as rinsing of other classes of dyestuffs, and insures that the full wetfastness is obtained.

6) Wide possibilities of combination, stability to steam and heat, easy washing off and excellent stability of padding liquors together account for a further advantage, excellent reproducibility of shade.

Being reactive dyes, Drimarene-Y colors reportedly form stable chemical linkage with the fiber to give extremely high fastness to wet treatments (dyeings withstand several alkaline washes at the boil) and shades of unusual purity and brilliance.

At present the Drimarene-Y range comprises the following dyes:

Drimarene Yellow Y-4GL
Drimarene Orange Y-G
Drimarene Scarlet Y-GL
Drimarene Red Y-RL
Drimarene Red Y-2B
Drimarene Violet Y-RL
Drimarene Blue Y-RL
Drimarene Blue Y-GL
Drimarene Turquoise Y-G
Drimarene Navy Y-BL
Drimarene Grey Y-GL
Drimarene Black Y-BL

Two brilliant red dyes in the reactive class have been added to the Sandoz range of Drimarene-Z dyes for printing cellulosic fibers. Drimarene Scarlet Z-GL and Drimarene Red Z-RL are said to be very brilliant dyestuffs fully conforming to the high standards of the Drimarene-Z range, both as regards stability in printing pastes, ease of washing-off, and all other printing and fastness properties.

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New Colors Offered by Hilton-Davis

Three new colors for textile pigment printing have been developed and introduced by The Hilton-Davis Chemical Co Division of Sterling Drug Inc.

The new colors are a red, a brown and an orange. They are being offered in the company's Hiltone and Seabond printing systems. Hiltone is a water-in-oil system, and Seabond an oil-in-water system.

Hiltone Red B, an ITR type, produces prints of true carmine shade on cottons and synthetics. When reduced, these are said to produce highly attractive, bright, blooming shades of pink.

The brown gives rich shades, according to Hilton-Davis, and is fast to light, drycleaning and washing. It can be applied to cotton and synthetic fibers.

The orange pigment has exceptional drycleanfast qualities as well as good lightfastness and washfastness, the company states. It is also applied to cotton and synthetic fibers.

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Carbic-Hoescht Announces New Fast Color Salts

Carbic-Hoechst Corp, New York, NY, distributors for Farbewerke Hoechst AG, Frankfurt-Hoechst, West Germany, have announced three new Hoechst fast color salts.

Fast Grey Salt G and Fast Grey Salt B are said to produce with naphthols fast-to-light, dischargeable grey shades of excellent fastness to washing, including chlorine.

Fast Blue Salt OT reportedly contains a new buffer system, eliminating any additions to the developing bath. Fast Blue Salt OT produces dischargeable navy blue shades on naphthols which are said to be very fast to light and washing.

Carbic-Hoechst, which also distributes for Durand & Huguenin SA, Basle, Switzerland, has added four new dyes to its range of colors for anodized aluminum. All four are homogeneous products, are said to have a very good to excellent fastness to light, and are especially manufactured for use in the anodizing industry.

The new colors are: Aluminum Bluish Green L2W, Aluminum Rubine BLLW, Aluminum Red Brown RLLW, and Aluminum Violet BLLW.

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New Skein-dyeing Machine for Zipper Tapes

A new, all-stainless-steel construction skein-dyeing machine for zipper tapes and other narrow fabrics has been announced by Klauder Weldon Giles Machine Co, Adams Ave & Leiper St, Philadelphia 24, Pa. Design of false back and indirect heating coil reportedly eliminates snagging of loose tape ends, and both natural and man-made fibers are readily handled.

Skeins are suspended in a relaxed condition between stainless-steel dyesticks. Separate dye and chemical feed system is used, also steam coil for indirect heating of the bath. Instrumentation can be provided to control bath temperatures. Front doors are normally air-operated but can be made to suit customer's requirements.

A complete line of models, from 10 to 50 stick machines, provide capacities from 190 to 500 lbs with an overload capacity, depending on material and shade, up to 100%.

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Freon-TF Solvent

Freon-TF solvent works effectively, and much more safely than carbon tetrachloride, in Soxhlet extractors used in the textile industry to remove oils and greases from both natural and synthetic fibers, Du Pont chemists report.

Big advantage of Freon-TF reportedly rests in its relative freedom from inhalation toxicity. Continuous Soxhlet extraction runs can be made without providing special vapor exhaust systems recommended for handling the much more toxic carbon tetrachloride, it is claimed. It is further claimed that, because the selectively dissolved oils encountered in such fiber cleaning operations are nonvolatile, they will not be vaporized when the Freon-TF solvent is evaporated from the flash at the end of an extraction run. This makes for easy recovery of the straight oils for further study.

Reactone Range Comprises Eight Colors

Reactone, the new line of highly concentrated reactive dyes recently introduced by the Dyestuffs Division of Geigy Chemical Corp, are available in a range of colors for printing especially on cotton and regenerated cellulose. The range at the present comprises the following colors:

Reactone Brilliant Yellow 4GL 140%
Reactone Orange G 125%
Reactone Red 2B 170%
Reactone Violet BL
Reactone Blue RLD
Reactone Turquoise Blue FGL 160%
Reactone Navy Blue GRL
Reactone Black RL

Reactones form a chemical linkage with the cellulose and the stable bond of dyestuff with fiber reportedly ensures outstanding wetfastness. The dyes are said to dissolve very readily and prepared printing pastes have outstanding stability, reportedly permitting storage for several weeks without danger of precipitation or decomposition. It is stated that they have virtually no affinity for cellulose after fixation and that removal of unfixed color presents no difficulty. The tendency to bleed is negligible and grounds remain clean, it is claimed.

It is stated that Reactone dyes can be used in combinations by either screen or roller printing methods to produce a wide range of shades of all depths, from dull to very bright. Some are especially suitable for full shades.

Reactones can be steamed or heat fixed. Fixation times are said to be extremely short, reproducibility is good, formulations are simple, and they can be applied alongside other types of dyestuff.

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Genacron Blue 3R, Violet BN, Blue GGL

Three new disperse dyes, developed by the Dyestuff and Chemical Division, General Aniline & Film Corp, are currently being made available. Two brochures just issued—Circulars #G-808 and #G-809—contain illustrative fabric swatches and discuss working and fastness properties of the dyes.

Genacron Blue 3R and Genacron Violet BN—Circular #G-808—offer related violet-blue shades in the Company's Genacron range of disperse dyes, recommended primarily for dyeing polyester fibers. The feature of the two products reportedly lies in their high color value, excellent buildup, and fastness to light, washing, perspiration, and hot pressing. The dyes are said to be particularly well suited for deep blue and navy shades on dress goods and suitings.

Genacron Blue 3R reportedly yields bright reddish blue shades on polyester fibers, for self-shade dyeing or as an economical base or shading color for fast blue and navy tones in all practical shade depths.

Genacron Violet BN reportedly dyes a bluish violet hue, has properties similar to those of its companion product, and serves equally well as a base or shading dye.

The third new color, Genacron Blue GGL—Circular #G-809—is said to dye an attractive, greenish blue shade on polyester fibers. The dye is reported to be highly suited for this purpose, exhibiting strong tinctorial value and buildup, very good stability to sublimation, and excellent fastness to light, washing, and perspiration. High heat stability permits dyeing by pressure or pad-heat curing methods as well as by carrier application, and the clean, bright shade is especially useful for dyeing medium to heavy shades of blue, green, or navy for wearing-apparel fabrics, it is claimed.

The new dyes are supplied as uniformly fine, dispersible powders. It is stated that application of the dyes can be made by all conventional methods to stock, yarns, or piece goods of straight polyester-fiber goods or blends containing wool, cotton, or viscose rayon.

The two circulars describing the new dyes are available by written request to General Aniline & Film Corp, 435 Hudson Street, New York 14, NY.

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Procion Rubine HBS

Procion Rubine HBS is a new specialty product just added to Arnold, Hoffman & Co, Inc's established range of reactive dyes. Procion Rubine HBS is described as representing a marked technical advance over existing reactive dyes of the hot-dyeing type in the bluish-red category.

Compared with the earlier Procion Rubine H2BS, which it will largely replace, the new dye has better solubility and superior building-up properties, and in shade it is yellower and somewhat brighter.

In textile printing, where it is anticipated the main value of Procion Rubine HBS will be found, a further advantage is said to be virtually complete absence of staining of whites when washing off prints, while the higher solubility of the new dye reportedly will permit it to be printed at much higher concentrations. Ahco states that Rubine HBC fixes more rapidly than Procion Rubine H2BS, five minutes' steaming being adequate; and on all cellulosic materials except melamine-formaldehyde-treated cottons it also shows a slight advantage in lightfastness. Its print paste stability is termed "excellent."

In textile dyeing, Procion Rubine HBS reportedly can be applied to cellulosic fibers by all the continuous and semicontinuous methods established for Procion "H" dyes, giving attractive bluish red shades of high level and washfastness together with good color value. It can also be applied by hot batchwise processes, giving good build-up and color value.

Procion Rubine HBS was developed by the Dyestuffs Division of Imperial Chemical Industries Ltd and is now available in the USA only through its subsidiary, Arnold, Hoffman & Co, Inc.

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Metrotex Superfast Colors

Metro-Atlantic, Inc, Centredale, RI, has announced a new system of water-phase pigment printing colors to be marketed under the name Metrotex Superfast Colors. It is claimed that this entirely new system offers properties and fastness qualities superior to those heretofore experienced with other water-phase pigment printing systems.

Metrotex Superfast Colors are said to combine greater washfastness and drycleanfastness with greatly increased wet and dry crockfastness, and their compatibility and flexibility reportedly allow them to be used to produce discharge effects on D & D and selected dyed grounds. With these colors, it is said to be possible to produce such discharge effects and yet maintain the ultimate fastness of the pigment.

Metro-Atlantic reports that it has found that this system gives much better cover on blotch patterns, thereby eliminating many of the engraving problems that have been encountered in this type of work. The Company also has found that low crock additive is not necessary in this system except in very heavy and exceptionally strong shades.

Metro-Atlantic claims that this system has much better running qualities than those afforded by water-phase systems used heretofore in that here is no foaming and consequently much less down time on the printing machine. These system also gives much brighter and clearer shades than do other pigment printing systems, it is claimed.

Aston 123

Aston 123 is a new durable antistatic agent developed by the Onyx Oil & Chemical Co, Jersey City, NJ.

Aston 123 reportedly requires no complicated processing and uses normal equipment found in most finishing plants. This new product is applied by cross-linking with Eponite 100, manufactured by Shell Chemical Co.

Aston 123/Eponite 100 is applied by padding. Normal drying is said to be all that is necessary in order to achieve durability. Processing can be carried out over a wide range of pH and it is felt that after-wash is unnecessary on medium to darker shades.

The Textile Fibers Division of E I duPont deNemours & Co, Inc, has applied for patent application of the combination of the two chemicals as applied to yarn, staple and tow and fabrics. This is described in duPont's Multi-Fiber Bulletin X-114. However, exclusive application rights are reserved for only the application to yarns, staples and tow. Applications to fabrics will be royalty-free to the trade.

Literature and samples are available from Onyx upon request.

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Uvinul N-35; Uvinul N-38

Two new ultraviolet absorbers, Uvinul N-35 and Uvinul N-38, have been announced by the Dyestuff and Chemical Division, General Aniline & Film Corp.

The two products are the first of a new family of UV absorbers which are chemically identified as substituted acrylonitriles. Reportedly unlike other available UV absorbers, they do not contain acidic aromatic hydroxyl groups and show excellent UV absorption properties under varying pH conditions. The absence of these acidic groups suggests uses of these new compounds in systems which would be adversely affected by their presence.

Uvinul N-35 and N-38 are said to be particularly suitable for protecting nitrocellulose lacquers against UV degradation, without adding undesirable color to the coating. They may also be of value in other systems such as butadiene-styrene latex, melamine-formaldehyde, urea-formaldehyde, epoxy-amine and nylon formulations.

Additional information and literature may be obtained by writing to GAF's Dyestuff and Chemical Division, 435 Hudson Street New York 14, NY.

In this demonstration of Hycar 2671, nonwoven fabric made with the new product is unaffected by drycleaning solvents (right), while (left) nonwoven fabric treated with conventional binders rapidly deteriorates after only a few seconds in the solvent.

Hycar 2671

Full-scale production of a new basic material for use as a finishing agent in the textile and other industries got underway April 1.

The new material—a reactive acrylic latex—has been named Hycar 2671 and will be produced at B F Goodrich Chemical Co's Louisville Ky, plant.

Hycar 2671 has been available in developmental quantities for several months under the designation Hycar 2600X67. During this period, it has been used in such diverse applications as backings for upholstery and drapery fabrics, binder for nonwoven fabrics, and as an adhesive or laminating agent.

It is claimed that textile manufacturers using the new latex need only adjust its viscosity in order to back-coat a wide range of fabrics to obtain such desirable characteristics as washfastness, drycleanability, good hand and resistance to discoloration. The resulting decrease in compounding operations is said to result in lower processing costs.

It is suggested that full-scale production of Hycar 2671 may also lead to the expansion of nonwoven fabrics to the outerwear field. Producing nonwovens with the new latex reportedly gives them properties that make them practical for apparel. It is said to simplify the compounding, reduce processing costs, and increase the stability of nonwovens. B F Goodrich Chemical reports that the new product solves the problem of nonwoven washability and drycleanability that heretofore has kept this type of construction out of the outerwear field.

Another area where the new product is expected to find wide acceptance is as a fabric adhesive and laminating agent. The possibility of using adhesive materials for assembling apparel has intrigued the garment industry for many years. Early attempts were frustrated because the seams did not hold well, were stiff, and discolored the fabric. In field tests, Hycar 2671 reportedly overcame these problems.

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Heberlein to Finish with Eversan

Heberlein & Co, AG, Swiss nylon manufacturing and finishing concern, has signed an exclusive agreement with Ions Exchange & Chemical Corp, New York, NY, for the use, in Switzerland, of Eversan antibacterial treatment.

Heberlein will use Eversan to treat its own products, Helanca textured nylon fabric, as well as cottons and other materials finished in its plant for distribution in Europe. The first shipment of Eversan to Heberlein reportedly will be used to process 300,000 yards of fabric. The capacity of the Heberlein finishing plant is said to be more than 100 million yards of textiles per year.

The Heberlein—I-X arrangement was concluded on the basis of the results of tests made on Eversan treatment at the Hygiene Institute of the University of Zurich. According to these findings, Eversan's antibacterial qualities remained in the fabric after five half-hour boilings with soap and soda ash. The Swiss and other independent laboratory studies reportedly prove that Eversan treatment not only resists the growth of odor-forming bacteria, but also provides life-lasting protection against a broad spectrum of other bacteria, including staphylococcus.

Eversan, it is claimed, retains full effectiveness for longer than the life of most garments—for more than 60 washings, even in near-boiling water and with detergents and commercial bleaches, such as chlorine. It is said to be nontoxic, non-irritating, colorless and tasteless. These and other claims have been certified and registered with the United States Department of Agriculture.

Eversan is distributed in the United States solely by Yardney Chemix Corp, 40-50 Leonard St, New York, NY.

Softener A

A softening agent that reportedly can be used on any type of fiber has been developed by the W F Fancourt Company, 516 S Delaware Ave, Philadelphia, Pa.

The new softening agent, marketed as Softener A, can be used on both synthetic and mixed fibers. It is said to impart a full, soft hand with excellent body to piece goods, knit goods, stock or yarn, and is suitable for treating bleached, dyed or printed textiles.

Softener A reportedly offers excellent resistance to yellowing at high temperatures or during long storage periods. It is said to give lubricity to dyed yarns, thereby improving their knitting or weaving, and will not adversely affect the lightfastness and shades of any dyestuffs.

Softener A, being amphoteric, may be used alone or in combination with other finishing materials, according to Fancourt. Literature sheets and specifications on its use may be obtained by writing to the company.

Founded in 1904, W F Fancourt maintains offices in Burlington, NC. It is also represented by Chemtex Products, Inc, in Toronto, Ont, Canada; Paykel Brothers, Ltd, in Australia and New Zealand; and by A M Romero Corp, in the Carribean, Central and South America areas.

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Lanafast Line Comprises Seven Colors

The list of Lanafast premetallized dyestuffs now available from Althouse Chemical Co includes: Yellow RFL, Orange RDL, Bordeaux RLL, Rubine BLF, Violet BBL, Navy NLF, and Black NBG.

The Lanafast dyestuffs are applicable to wool, nylon, Creslan, Zefran and Acrilan fabrics as well as mixtures and combinations of these fibers. They are said to have been found especially suitable for upholstery, carpets, men's and ladies suitings and sportswear fabrics over a wide range of fashion shades.

Lanafast colors have been successfully used in conjunction with each other for the production of compound shades. Application is carried out under standard procedures.

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New Procedures Help Control Delamination in Natural Rubber Bonded Nonwoven Fabrics

Over the past few years, nonwoven fabrics in which the binder is incorporated as an aqueous emulsion have found growing usage in the clothing industry. One of the problems with this type of fabric has been delamination. For many of the end uses to which these fabrics are put, delamination is no particular concern. If, however, the fabrics are to be coated, pressed or used in conjunction with adhesives, delamination can cause processing difficulties and rapid breakdown in service.

In order to broaden the number of uses to which nonwoven fabrics can be put, Rubber Technical Developments, one of the research laboratories of the natural rubber growers of Malaya, has recently been conducting a series of experiments directed at minimizing such delamination.

Early work developed that delamination occurs because the latex particles are too small to be trapped in the fibrous structure and are carried to the surface by the movement of water during the drying process. To offset this migration of the latex particles the RTD research team experimented with a number of gelling agents. Generally, those agents divide into two classes, external and internal. The "external" includes acids and salts of multivalent metals. The applications of these agents involve the use of a double impregnation system, and necessitates washing the fabric to improve color, odor and aging characteristics.

The "internal" agents include zinc ammonium salts and nonionic polymers such as polyvinyl methyl ether and polypropylene glycols. These agents are added to the latex itself before impregnation is effected, and if the latex is suitably compounded, the are inactive at room temperature. When the temperature is raised, however, the agent becomes active and causes the latex to coagulate. As opposed to the double impregnation required for the "external" agent, here only a single application is involved.

Since it developed that internal gelling agents were the most easily applied, the RTD team concentrated its efforts on working with heat-sensitive rubber latex compounds formulated with this type of gel.

A recent issue of "Rubber Developments" thoroughly describes the work that has been carried on with zinc ammonium salts, polypropylene glycols and polyvinyl methyl ether. It also details the gelling conditions required to prevent migration of the latex particle, methods of factory control and the storage needs of heat-sensitive latices.

Based on their experiments to date, Rubber Technical Developments researchers find the heat-sensitive rubber latex compounds control delamination of nonwoven fabrics by providing the following advantages:

1) The internal bond is greatly improved. Fabrics can be coated, pressed or used in conjunction with adhesives with greater confidence.
2) There is an overall improvement in strength.
3) The concentration of rubber binder on the surface of the fabric is reduced. There is consequent reduction in surface friction, which gives the fabric a more pleasing handle.
4) Production of high rubber content fabrics is facilitated.
5) The wet calendering technique enables water to be squeezed out and the ultimate drying time is reduced. In addition, resulting material is more dense, again improving handle of the fabric.

The aforementioned issue of "Rubber Developments" contains a comprehensive description of this improvement in nonwoven fabrics, including diagrams and tabulated test statistics. For a free copy, write to the Natural Rubber Bureau, 1631 K Street, NW, Washington 6, DC.

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Aceto Adds New Intermediates

Aceto Chemical Co, Inc, 40-40 Lawrence St, Flushing 54, NY, has added five new intermediates to its line: p-phenylene diamine, m-toluidine, o-chloraniline, m-chloraniline, and p-chloraniline.

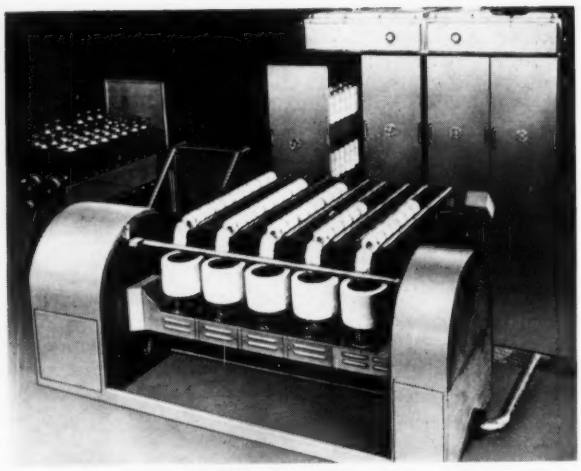
p-Phenylene diamine is used as an intermediate in the manufacture of black and brown aniline colors for textile printing, and in the production of various sulfur dyes.

m-Toluidine is used in the manufacture of cotton, cellulose acetate, and triphenylmethane wool dyestuffs.

o-Chloraniline is used in the manufacture of a coupling agent in common use in yellow pigment manufacture, viz CI Pigment Yellow 3. It is also used directly as a diazo component being coupled with Schaffer acid. Like other amines, it is also sold to the textile trade as a fast base, after conversion to hydrochloride, as CI Azoic Diazo Component 44.

o-Chloraniline is used in the textile field after conversion to the hydrochloride as CI Azoic Diazo Component 6.

p-Chloraniline serves the pigment industry, where it is employed in conjunction with alkylated ureas, eg, p-chloro-phenyl dimethyl urea.



Scholl Secomat

Scholl Secomat

The Scholl Secomat dryer, a product of Cosa Corp, 405 Lexington Ave, New York 17, NY, is a two-unit, semi-automatic dryer for all types of dyed yarns. The first unit consists of centrifuges for moisture extraction, which are automatically loaded and unloaded by conveyor chutes. The second unit completes the drying process by forcing steam-heated, dry air through each spool of yarn, from the inside, out.

In operation, freshly dyed spools of yarns are placed in the conveyor chutes, which are individually driven by ½ hp motors. Vibratory action travels the spools toward the centrifuges, which automatically accept the spools, spin dry them at 6500 rpm for 30 seconds, and then deposit them in a lower layer of conveyors for removal to the hot-air dryer.

The Secomat accommodates up to five centrifuges with auxiliary conveyors. Centrifuge baskets are 6.9" high and are made in four widths to accommodate packages up to 8.3" OD. Each conveyor is adjustable for specific demands. A photo-electric "eye" scans the whole process.

Approximate moisture contents of the yarns after this first process are reported to be: synthetics 15-25%, wool 25-35%, cotton 50-60%, spun rayon 70-75%.

In the dryer, the yarn is subjected to a flow of hot air applied by motor-driven ventilators. The air flows from the inside of the spool to the outside. The spools are loaded on spindles which are, in turn, placed and locked onto trolleys for placement in the drying chamber. Each spindle can hold three spools—each trolley holds up to 64 spindles of 5.5" OD. Each row of spindles has a separate air intake which can be shut off individually. A humidity test device tests each spindle of yarn, and shuts off air supply when the yarn reaches a preselected comparative dryness. The rest of the yarn in the drying chamber continues to receive air treatment until the same dryness is reached.

Temperature is thermostatically controlled for each ventilator and is adjustable up to 60 or 70°F below that of the heating medium.

Average drying times range between one-half hour for synthetics, and 2.5 hours for spun rayon.

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Cellosize QP-4400

A new, quick-dissolving, water-soluble resin, Cellosize hydroethyl cellulose QP-4400, is now available commercially from Union Carbide Chemicals Co. The new grade of hydroxyethyl cellulose reportedly can be stirred into water solution almost as easily as sugar, and there is no agglomeration.

Cellosize QP-4400 is a nonionic thickener that is said to be compatible with anionics, cationics, and nonionics; is an efficient protective colloid and stabilizer; and has a high tolerance for electrolytes. In water, it is said to be nongelling even at the boiling point of the solution. It reportedly has high thickening action, even in low concentrations, and is low foaming in water solutions.

Cellosize QP-440 can be used in most thickening applications, such as print pastes for the printing and textile industries.

The price for Cellosize QP-4400 is $0.89 per pound in lots of 2,000 to 20,000 pounds. Further information and prices for smaller quantities are available from Union Carbide Chemicals Co, 30 East 42nd St, New York 17, NY.

Dylex K-40

A new styrene-butadiene latex designed to meet the requirements of the textile industry for a latex which will produce a soft hand, yet not require vulcanization, is now being produced by the Plastics Division of Koppers Company, Inc.

Known as Dylex K-40, this product is said to primarily fill the need for a latex which will produce a more pliable carpet backing, especially where scrim is applied. In addition, Dylex K-40 is also finding application in the upholstery field because of its flexibility.

The Company claims that this is the "softest" styrene-butadiene latex obtainable among the various types which do not require vulcanization. Available only with an antioxidant already incorporated into it, Dylex K-40 is reported to have successfully passed rigid aging tests and to retain its flexibility under extreme aging conditions in laboratory tests and field trials. Koppers is now making it commercially available at the same price as other latices of the nonvulcanizing type.

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Crestex Antistat B

A new antistatic agent for use on nylon, acetate, Dacron, Orlon and other hydrophobic fibers has been developed by Crest Chemical Corp, 225 Emmet Street, Newark, NJ. The company reports that Crestex Antistat B is highly effective for the elimination of static build-up. Treated fabrics are claimed to have a better appearance and hand, to resist lint and dust soiling, to avoid unpleasant electrical shocks, to eliminate the clinging and riding-up which often takes place with untreated garments.

Crestex Antistat B is described as an amber-colored viscous liquid readily soluble in cold water, stable to storage and neutral in pH. It reportedly can be used to treat dyed fabrics with no change of shade or white fabrics with no yellowing and is compatible with nearly all types of finishes including resins, softeners, fixatives, etc. Crest Chemical reports that it can be used at any pH and is applied from a short bath such as a pad or quetsch or from a long bath by exhaustion.

This agent is applied to textiles in quantities of 0.1 to 2% on the weight of fabric in order to effect antistatic control. It is recommended by the manufacturer for use in the spinning of continuous filaments and is said to eliminate ballooning of yarn during rewinding or warping.

PAD, RANGE, OR JIG, PACKAGE OR PRINT MACHINE— SEE SANDOZ FOR VATS!

Versatility in vat colors is a must. That's why SANDOZ has the correct vats for every use—pigment padding, package dyeing, printing.

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For package dyeing, Sandothrene Ultrasperse® dyes have been proved time and again, in chromatographic tests and in practice, to offer the finest particle size, plus freedom from agglomerates.

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SANDOZ

THINKS AHEAD WITH TEXTILES

SANDOZ

Rhoplex HA-8

A reduction in price has been announced by Rohm & Haas Co, Philadelphia, for an acrylic resin emulsion product used in the production of nonwoven fabrics and in other textile operations. The product, formerly known as Experimental Dispersion HA-922B, has now been given the commercial name Rhoplex HA-8, and the price has been reduced nine cents per pound in all quantities. The new truckload price is twenty-five cents per pound.

Rhoplex HA-8 is described by the manufacturer as a self-crosslinking acrylic polymer in nonionic emulsion form. Although developed specifically as a washfast binder for nonwoven fabrics, the product is said to exhibit a durability to repeated washing and drycleaning that makes it of interest in additional applications, such as pigment binding, the backing of automotive and furniture upholstery, and the production of durable finishes on fabrics composed of natural and synthetic fibers.

According to the manufacturer, crosslinking of the resin is obtained without the addition of nitrogenous or other external crosslinking agents, and the resin will cure at temperatures as low as 250°F. At higher temperatures, the company states, a minimum amount of Rhoplex HA-8 will give durability comparable to that commonly obtained by higher concentrations of many other binders.

It is reported that Rhoplex HA-8 exhibits the stability normally associated with other acrylic emulsions used in textile finishing. It is expected that at the new price the product will find extensive use in textile applications where durability to laundry and drycleaning operations, combined with resistance to discoloration on aging or exposure to ultraviolet light, are desired properties.

A technical bulletin describing the properties and uses of Rhoplex HA-8 is available. Requests should be directed to Textile Chemicals Dept, Rohm & Haas Co, Washington Square, Philadelphia 5, Pa.

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Metrosol RX

Laurel Soap Manufacturing Co has released to the trade a new one-step washing and finishing compound. Known as Laurel Metrosol RX, it is recommended by the manufacturer for washing of woolen and wool-blend sweaters and other garments after knitting.

Laurel Metrosol RX reportedly does a quick, efficient job and gives very low residual oil contents which assure an odor-free and nonstaining garment.

When applied as recommended, Laurel Metrosol RX can be used on all types of garments, including heathers, and fancy striped goods, without danger of color bleeding into the light stripes, it is claimed.

Complete details and a working sample are available from Laurel Soap Manufacturing Co, Inc, Tioga, Thompson and Almond Sts, Philadelphia, 34, Pa.

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Depco Level 52

The De Paul Chemical Co has announced the development of Depco Level 52, a new leveling agent for basic dyes.

Depco Level 52 is said to offer the combined properties of both leveling and stripping. In the event of shaded lots of Orlon or other acrylic fibers, the addition of the required amount of Depco Level 52 reportedly will remove the dyestuff from the darker areas and cause it to be redeposited evenly. In cases where a lot has been dyed evenly, but has come up darker than the required shade, the use of Depco Level 52 reportedly will reduce the dye to the desired shade. It also is said to be very effective when a lot must be redyed to a darker shade. The use of Depco Level 52 eliminates the necessity of scouring, it is claimed, as it is not necessary to remove the retarder from the goods before re-dyeing.

In blends such as Orlon and mohair, etc, it is impossible to strip an uneven lot with sodium chlorite because of the possibility of destruction of the mohair. Depco Level 52 reportedly will strip the color to the extent that it is possible to re-dye in a darker shade.

Samples and technical information are available from the De Paul Chemical Co, 44-27 Purvis St, Long Island City 1, NY.

●

Morpatex 50

A new metallic pigment binder which is claimed to offer "an unusual number of desirable properties for application printing on cotton, glass, and synthetic fibers," has been announced by Moringstar-Paisley, Inc. The product, Morpatex 50, is supplied as a water-extendable emulsion, utilizing thermoplastic and elastomeric polymers. According to the manufacturer, Morpatex 50 offers: 1) prolonged resistantce to both drycleaning and laundering; 2) an unusually soft hand; 3) good luster unaffected by pigments or organic colors; 4) nondiscoloration on aging; 5) nontarnishing of metallic powders by perspiration: and 6) complete stability after incorporation of the metallic powder.

Morpatex 50 is said to be an effective binder for gold, copper or aluminum powders and can be printed along with other colorants in practically the full range of dyestuffs. It reportedly can be applied on conventional printing machines, hand and automatic screen printing machines. Storage life prior to addition of pigment is said to be a minimum of three months. After pigment addition, storage life is said to be more than a month. Mechanical stability is reported excellent. The viscosity of Morpatex 50 is in the range of 9500 cps on a Brookfield at 20°C.

Further information can be obtained by writing to Textile Dept, Morningstar-Paisley, Inc, 630 W 51st Street, New York 19, NY.

●

Tinolite Pigment Discharge Print System

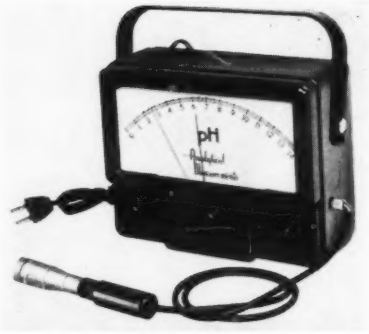
A new method to discharge print cottons in sharp and bright colors with high fastness to washing, light and drycleaning reportedly has been developed by Geigy Dyestuffs, Division of Geigy Chemical Corp.

The new procedure, called Tinolite Pigment Discharge Print System, is said to be the first practical oil-in-water pigment emulsion system for discharge printing.

The new method reportedly combines ease of application with quality equal to that normally associated with conventional dyestuff discharge printing. In addition, the new method is said to result in lower color and production costs. A full line of shades can be produced.

Geigy Dyestuffs has announced also a method of reducing time and costs in dyeing leotards and other articles knitted from textured filament nylons. The method is said to involve the proper selection of dyestuffs and dyeing procedures, which simplifies the processing of those items.

Three ranges of dyestuffs have been dealt with, relating to normal selection for minimum barré, special selection for minimum barré (light-to-medium depth). and blacks. The proper staining of Orlon and Dacron is also considered. The dyeing procedures are declared to be extremely simple. No involved pretreatments are recommended, nor is the after-treatment in a fresh bath necessary for improving fastness. Combinations of selected auxiliary products have been carefully worked out by the Geigy laboratory in order to achieve savings in time and cost.



Model 700 pH Meter

Model 700 Big-scale pH Meter

Analytical Measurements, Inc has announced the Model 700 Big-scale pH Meter, designed to simplify the reading of pH values within .02 pH. Easily portable (it weighs five pounds), the Model 700 reportedly can be used wherever a standard 115 volt ac outlet is available.

This instrument is said to be the first of its kind to provide a truly big scale, so that it may be read quickly and easily, and a compact housing, so that it may readily be carried in one hand and used where it is needed.

The Model 700 Big-scale pH Meter features a single operating control and a high output electronically modulated amplifier, with printed circuitry and sensitive meter elimination. The originally designed polyethylene electrode probe unit is said to greatly enhance the versatility and usefulness of this instrument, since it may be used to make pH readings anywhere on the production line.

Price of the Model 700, complete with probe unit, buffer and KCl solution is $145.00, fob Chatham, NJ. For further information, send for illustrated brochure No. 700 to Analytical Measurements, Inc, 585 Main Street, Chatham, NJ.

●

Fabtex

Development of Fabtex, a new nonflammable latex adhesive for laminating polyurethane to fabric, has been announced by Adhesive Products Corp, 1660 Boon Ave, New York 60, NY. Fabtex is said to be waterproof and resistant to solvents, making possible the manufacture of insulated clothing which can be washed and drycleaned. The adhesive reportedly is self-vulcanizing and actually welds the fabric the fabric to polyurethane or polyether foam.

Fabtex is film-forming and can be used where a washable or solvent-resistant film is required. It may be applied by roller coating machine as an all-over coating or may be spot glued. No solvents are required to thin Fabtex, which machines well and gives excellent mileage, it is claimed.

Fabtex is available in one and five-gallon cans and in 55-gallon drums.

●

Automatic Nitrogen Analyzer

Just released is a new, automatic nitrogen analyzer designed and manufactured by Coleman Instruments, Inc, 42 Madison St, Ill. A fully automated means of performing the time-tested micro-Dumas method, it is said to represent the most significant advance in 50 years of nitrogen analysis.

Within its 12-to-15-minute cycle, it performs a complete determination of nitrogen content. It reportedly will measure nitrogen in an almost unlimited variety of materials and it is said to be excellent for numerous determinations presently made by the Kjeldahl process.

It is claimed that operation is simple and only one operator is necessary for continuous determinations. Nitrogen is gathered in a new type of nitrometer, and nitrogen volume is read directly in cc's from a digital counter. Eighteen inches of lab bench space are required for the instrument.

Introduced at the 11th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy on February 29, this new Coleman instrument reportedly achieves all the accuracy inherent in the micro-Dumas process, and it is said to eliminate individual analytical technique as a factor in the analysis.

The Coleman Automatic Nitrogen Analyzer is priced at $2495.00 complete. Application information and product literature are available from Coleman Instruments, Inc.

Coleman Automatic Nitrogen Analyzer

Low-form S-Rack

Low-form S-Rack

Fisher Scientific Co, 316 Fisher Bldg, Pittsburgh 19, Pa, has added a low-form, S-shaped rack to its test-tube rack family.

The low-form, which joins the large S-rack and semimicro S-rack, is said to be ideal for standard absorption cells. It has eight holes one inch in diameter. It is nine inches long, 2-¾″ wide, 2-⅜″ high.

The large rack is for six test tubes of lengths of four inches up, diameters up to ⅞″. The semimicro is for 12 small tubes up to 9/16″ OD.

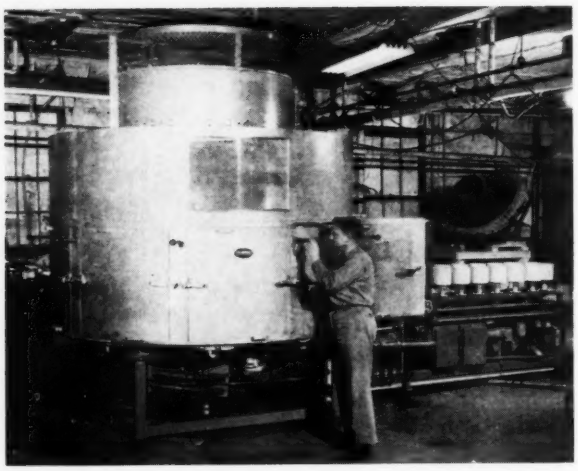
All three models are one piece anodized-aluminum and sell for $1.80 each.

●

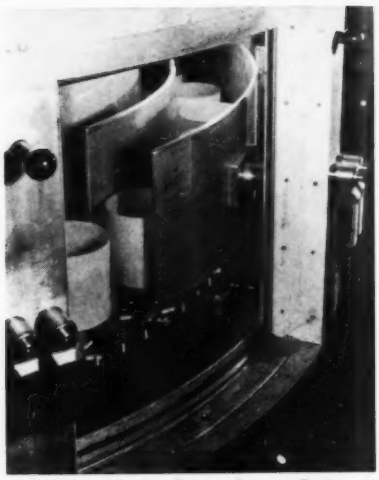
Crestosoft AS Conc

Crest Chemical Corp, Newark, NJ, has announced the development of Crestosoft AS Conc, a highly concentrated nonionic softening agent. This softener is reported to be unusual in that it is absolutely pure white in color. Crestosoft AS Conc reportedly may be used with acids or alkalis and is said to be compatible to all types of finishes, resins, catalysts, and fixatives.

This material is claimed to impart a soft hand to all fabrics, to excel for backfilling and top softening. It is said to have absolutely no effect on shade of pastel-dyed goods, to preserve maximum lightfastness, to show no yellowing of whites, and to avoid chlorine retention. Crestosoft AS Conc reportedly may be used with urea-formaldehyde, melamine and cyclic resins to obtain a soft lofty hand with maximum draping qualities. Used with resins, this product is said to minimize tensile strength loss, add to abrasion resistance, increase tear strength, and improve sewability characteristics.



Overall view of Super Power Dielectric Dryer marketed by New Rochelle Thermatool Corp, 320 Main St, New Rochelle, NY. Dryer is said to meet the most stringent requirement of all producers of filament rayon by the pot-spinning method. (See story on page 68-70 of March 21 issue).



A view of the Super Power Dielectric Dryer with one of the panels removed to show the buckets containing moist product moving between electrodes through which 30 megacycle current flows to effect the drying operation.

Abstracts

Latices in the Textile Industry

Shailer, L L, *Can Textile J 77*, 45-8, Jan 8, 1960

The latices most commonly used in the textile industry at present include styrene-butadiene rubber (SBR), natural rubber, polyvinyl acetate, polyvinyl chloride, and nitrile and acrylic types.

The outstanding use of latices in textile manufacture is found in the production of nonwoven fabrics. Polyvinyl acetate has found widespread usage in nonwoven manufacture primarily for disposable products where poor washfastness is not detrimental. Polyvinyl chloride offers the basic advantages of low cost, excellent heat-sealing properties, and toughness and durability. The nitrile latices have found favor where resilience, washfastness and drycleanability are essential characteristics. Acrylic latices have been favored where lack of discoloration is an essential requirement either initially or on aging.

Latices have found widespread use in the treatment of fabrics for dimensional stabilization of both woven and knit goods, to improve their performance by reducing distortion and shrinkage.

A major market for latex compounds that has developed only since World War II is to be found in the back-coating of carpeting, upholstery, etc, to adjust the fabric weight and hand and to improve the dimensional stability. Natural and SBR latices were introduced in this field to obtain durability, and are still largely used in carpet and rug manufacture. In the case of upholstery, drapery and deep-pile fabrics, however, there has been a shift toward the nitrile and acrylic products.

Decorative finishes represent a large and expanding field for latices of the nitrile, vinyl and acrylic types. These particular thermoplastic latices have been favored because of their excellent binding characteristics combined with the good esthetic qualities which are essential. The growth of pigment printing is directly related to the improved latex products which have been made available in recent years.

Most of the thermoplastic latices have the ability to bind large quantities of inert dry pigments, which may be incorporated to reduce costs, provide opacity, or as colors.

Thermoplastic latices can improve the wear resistance of fabrics. The nitrile and acrylic types give the best results where a soft hand is desired. The vinyl plastic latex is used where a firm hand and a "permanent starch" finish are wanted.

Automobile door panel constructions, once a fragile stitched and stapled assembly of wadding and fabric, are now made by a high-speed heat-sealing technique, consisting of a sandwich made of hardboard coated with the latex, a "plumper" or wadding layer spray-bonded with compounded latex, and a finished covering of vinylcoated fabric.

Piece-goods which crock excessively are improved by an aftertreatment (eg, by padding) with dilute nitrile latex.

Finally, there has been an increase of interest in laminated constructions in recent years. Adhesive systems based on vinyl, nitrile and acrylic latices are preferred.

•

Technique of Fault Investigation (in Wool Processing)

Clough, D K, *Dyer 123*, 23-5, Jan 1, 1960

From the time a wool fiber emerges from its follicle to the time it finally ceases to exist, it is in a state of continual modification. While still on the animal's back it is subjected to the effects of light and moisture, and after removal from the animal it is subjected to such processes as scouring, dyeing, milling, crabbing, bleaching and chlorinating. All these processes applied to wool give rise to chemical modification, and yet we do not regard wool as "commercially damaged" after scouring or dyeing, except when a particular batch of wool has been unevenly modified during some treatment, so as to give rise to serious difficulties in further processing.

Faults can be divided into three groups: 1) faults observed before dyeing; 2) faults occurring or made apparent during dyeing; 3) faults occurring subsequent to dyeing. The majority of faults fall into the second group.

Faults from mechanical causes may

Dielectric
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be due to crease formation or temporary stoppage of the dyeing machine, and include mechanically degraded fibers having modified light-reflecting properties.

Whatever the type of fault, the first step in any investigation is to consider carefully its appearance, form and distribution, together with any information available on the history of the material. Having examined the faults in daylight, it is very often useful to re-examine them in u-v light.

A number of common textile contaminants are found to display marked fluorescence when viewed in this way. Among the most important of these are mineral oil, which exhibits strong violet/white fluorescence; vegetable oils and some metal soaps, which give rise to yellowish fluorescence; and optical bleaching agents which show strong violet or blue fluorescence. The products of mildew growth often show a yellow fluorescence, and scorched areas of wool fabrics are visible as dull greenish-yellow areas. Metal stains due to iron, copper and lead normally appear as a very dark area against a somewhat lighter background.

Uneven modification of the chemical affinity of the wool for dyes may be caused in a variety of ways (eg, uneven chlorination, too much alkali in scouring, etc). Correction of these faults is difficult.

Bad rubbing fastness and uneven dyeing are caused by grease and insoluble metal soaps left in the goods.

When dyeing faults are concerned, it is useful to determine whether the fault is reproducible, by stripping the material under the mildest possible conditions and redyeing with a similar combination of colors to that already present.

If the fault is found to be reproducible, a microscopical examination of fibers removed from the area of the fault and from normal areas often produces useful information.

Solvent extraction is used to determine the presence of water-insoluble residues in the goods (eg, metal soaps).

Carbonizing damage is determined by stripping and redyeing. Carbonized wool has a reduced affinity for acid dyes and an increased affinity for basic dyes.

A alkali-solubility test is used to assess local fiber damage due to changes in the chemical properties of the wool (eg, from rupture of the main peptide chains).

A number of other faults are discussed by the author, and several staining tests are recommended.

Observation on the Use of Copper Formate as a Rotproofer for Cotton Fabric

Rose, G R F, Howdon, J B and Bayley, C H, *Textile Research J 29*, 996-1005, Dec, 1959

Of the various organic compounds of copper which have been investigated for possible use as fungicides, the copper salts of the lower molecular-weight fatty acids, with the exception of the acetate, have not received much attention, due no doubt to their high solubility in water. However, work by Abrams and Bottoms (see *Textile Research J 26*, 630-40 (1956)) on the use of copper formate as a fungicide indicates that this compound, on heating to around 120° C, is converted to a different product, insoluble in water. They claim that cotton cellulose treated with copper formate, when heated in this way, undergoes cross-linkage with the copper.

The present authors were unable to confirm all of these findings, particularly with reference to the cross-linkage of the cellulose.

Strips of cotton duck were impregnated with a solution of copper formate, squeezed between blotting papers and dried at room temperature. One portion was heated in an oven at 120° C until a change to a brownish color took place. One portion was heated in an autoclave at 120°C; the color changed to a yellowish tan. The two samples were exposed to weather for four months, subjected to soil burial, and tested for breaking strength. The results of these and other tests are presented in tabular form.

The conclusions reached by the authors are that the process involving the heating of cotton fabric impregnated with cupric formate solution to produce a copper content of 0.4% or greater gives the fabric considerable resistance to actinic degradation and to microbiological attack. The manner in which the initial heating is carried out is of importance, oven heating causing appreciable chemical degradation, which is believed to be a combined effect involving oxidation of the cellulose under the action of heat and the hydrolytic action of the liberated formic acid. Autoclave heating gives only slight damage.

In view of the data obtained, they conclude that the protection which the treatment gives to the fabric is the result of the comparatively substantial concentration of copper, in the form of cuprous oxide, on the fabric. The apparent high efficacy of cupric formate as a treatment can be readily explained by the fact that, on heating, cupric formate decomposes to give copper in inorganic form (mostly Cu_2O); other organic compounds of copper do not behave in this way.

The data obtained in this investigation do not support the view that the copper is in any special condition of association with cellulose. The treated cotton is freely soluble in standard cuprammonium solution, and the copper in it can be substantially removed by repeated rinsing with dilute ammonium hydroxide, with intermediate drying.

Thirteen references to the literature are cited.

•

The Technological Story of Darvan

Reuter, L F and Johnson, R D, *Can Textile J 76*, 65-8, Dec 11, 1959

The molecular structure of the new nytril fiber, "Darvan", developed by the B F Goodrich Co, is based on vinylidene dinitrile.

Tests made by Fabric Research Laboratories, Inc, showed, the authors say, that the elasticity of Darvan "compares favorably with the naturals and surpasses any other synthetic." Results of tests made with the Beste & Hoffman technic indicated that the fiber has execellent crease recovery. It has a tenacity (gpd) of 1.7 dry, 1.5 wet, and a softening temperature of 350°F, which is said to be "high enough to prevent problems in cleaning and pressing."

Darvan is resistant to many chemicals, and is reported to be superior to the acrylics and polyesters in several ways, eg, in weather resistance and in degradation by organic solvents. It is unaffected by moths and mildew. The fiber, however, is degraded by kier boiling and by alkaline peroxide bleaching.

The dyeing of Darvan resembles that of polyester fibers more than any other type. The original Darvan required special dyeing procedures and selected dyes. A modification of the fiber, however, designated as Darvan X-7, can be dyed at the boil in a wide range of colors with disperse, naphthol, neutral and acid metallized, acid, chrome and basic dyes. Wool blends of Darvan X-7 can be union dyed.

The uses of Darvan include suitings, coatings, blankets, shirting, dress goods, sweaters and jersey fabrics. Knitted deep-pile fabrics made from Darvan have good resilience and are said to be softer than other chemical fibers. Cleaning procedures which produce tufts or exaggerated tufting in other fibers cause less injury to the deep-pile Darvan fabrics. Steaming has virtually no effect on the Darvan pile.

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DYE CHEMIST—BS or equivalent in chemistry plus five years dye house experience preferably as Dyer or Plant Chemist. Assist in studies of dyeing fibers and their blends and in customer service projects. Assignments in Decatur, Alabama laboratories offer excellent working conditions and employ benefit programs. Send resume of academic training, professional experience and salary history to: MANAGER, TECHNICAL EMPLOYMENT AND RECRUITMENT, BOX ARS 2, THE CHEMSTRAND CORPORATION, DECATUR, ALABAMA

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Abstracts

(*concluded from page 61*)

Cyanamid International's New Acrylic Fiber: Creslan

Anon, *Man-made Textiles 36, 37, Jan, 1960*

Creslan has a number of interesting properties. It is 10 percent lighter than wool and 25 percent lighter than cotton. It is unaffected by prolonged exposure to sunlight and has good resistance to strong organic and inorganic acids and drycleaning solvents. It is sensitive to alkalis, however.

In spite of its low moisture regain, it absorbs dyes easily, and the makers claim that it can be colored with more types of dyes in a broader spectrum of colors than any other synthetic fiber yet produced.

Raw stock, top, yarn and piecegoods can all be processed in standard equipment. "Carriers" or high-presure dyeing facilities are unnecessary. Blends of Creslan with other fibers can be dyed to obtain solid shades, two-color or heather effects by proper selection of dyes and pH and temperature control.

Drying temperatures not over 250°F are recommended. Resin finishes may be applied to blends of Creslan with cellulosic fibers or wool, to stabilize the fabric, change the hand, or improve the fastness to water-spotting or staining.

Other physical properties of Creslan fabrics include softness, high strength, wrinkle resistance, resilience, dimensional stability, resistance to moths, mildew and flame, and the ability to be durably creased or pleated.

The new fiber is said to be used in the U S in suits, dresses, sweaters, imitation-fur pile coats, children's clothing, upholstery, carpets and blankets. It is of special interest to the knitting industry.

For Rainwear, a New Durable Water-repellent Finish

Kennedy, S J, DeMarco, C G and McQuade, A J, Papers AATT, *Modern Textiles 41, 50-6, Feb, 1960*

The water resistance of fabrics has been of major concern to the QMC since even before World War II. One of the continuing objectives of its research program has been to overcome the deficiencies of existing water-repellent treatments and to achieve a truly permanent and vapor-permeable moisture-repellent finish which would enable the soldier to undergo prolonged exposure to rain on the battlefield without having his clothing become soaking wet.

There are two basic methods by which one can obtain water and rain protection in textile structures: 1) by the use of a barrier material; 2) by a water-repellent finish.

The barrier materials may consist of either a coating applied to a textile fabric or an unsupported film. The water resistance obtained from these materials both against rain and water impingement is offset from the standpoint of clothing by their impermeability to the passage of moisture vapor. Such clothing becomes uncomfortable in use and, in addition, in cold-climate clothing, creates the hazard of destroying the insulating properties of the under layers through their becoming saturated with perspiration.

The more satisfactory approach to this problem has been to apply a water-repellent treatment which does not affect the water-vapor transmission characteristic of the fabric. Such a treatment is the so-called "wax-type", in which wax is combined with metallic soaps.

This treatment lacks durability, since the water repellent is emulsified in laundering and washes out. It is, however, commonly employed in tents, equipage and other industrial uses.

In the late 30s a pyridinium-type treatment was developed, which partially reacted with the cellulose and achieved a certain degree of durability. Despite certain limitations, it was used by the military services in water-repellent cotton fabrics for the outer shell of the cold-weather combat uniform.

Certain fluorocarbon compounds have been introduced which, in addition to water repellency, have the additional advantage of resistance to oils. The durability to laundering, however, is not sufficient for military use.

A new water-repellent treatment has now been developed by the QMC laboratories, which is a definite improvement. The new treatment, which has been named "Quarpel", is said by the authors to be "a combination application of a pyridinium-type repellent with a fluorocarbon."

Tables are included, showing the water repellency of fabrics treated by the Quarpel method under various conditions, compared with the pyridinium and fluorocarbon methods used separately.

A raincoat made of nylon/cotton oxford was exposed in the QMC rain tower for five hours of one-inch rainfall with no leakage through the fabric, which was also completely water-vapor-permeable.

A Quarpel-treated cotton fabric, submitted to the dynamic absorption test, showed no loss in repellency after a two-hour laundering.

The QMC has applied for a patent covering the Quarpel process.

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INDEX TO ADVERTISERS

Imperial Color Chem. & Paper Corp.
Instrument Development Laboratories, Inc.
Interchemical Corp., Color & Chemical Division
International Salt Co., Inc.

Klauder Weldon Giles Machine Co.
Koppers Company, Inc. 3
Kragmar, Inc.
Laurel Soap Manufacturing Co.
Leatex Chemical Co.
Lestoil, Inc.

Manufacturers Chemicals Company, Inc.
Merrow Publishing Co., Ltd.
Metalsmiths Div., Orange Roller Bearing Co., Inc.
Metro-Atlantic, Inc. 24
Mettler Instrument Corporation
Monsanto Chemical Company
Moretex Chemical Products, Inc.
Morton Salt Co. 17

National Aniline Division, Allied Chemical Corp.
National Starch and Chemical Corporation
Nitrogen Division, Allied Chemical Corp.
Nopco Chemical Company
Nyanza Color & Chemical Co., Inc.

Obermaier & Cie
Olin Mathieson Chemicals Division 18
Onyx Oil and Chemical Company
Organic Chemical Corporation

Pabst Brewing Co.
Peerless Color Company, Inc. 49
Philadelphia Quartz Co.
Photovolt Corp.
Polymer Industries, Inc.
Polyvinyl Chemicals, Inc.
Procter & Gamble Co.
Putnam Chemical Co.

Reading Scientific Company
Refined Products, Corp.
Rhodia, Inc.
Riggs & Lombard, Inc.
Rohm & Haas Co.
Royce Chemical Company Fourth Cover
Rumford Chemical Works

Sandoz, Inc. 15, 16, 51, 57
Scholler Bros., Inc.
Semet-Solvay Petrochemical Division, Allied Chemical Corp.
Seydel-Woolley & Co. 47
Solvay Process Division, Allied Chemical Corp. 6
Sou-Tex, Inc.
Southern Dyestuff Company
Standard Chemical Products, Inc.
Sun Chemical Company
Synthetic Chemicals, Inc.

Tanatex Chemical Corp. Second Cover
Taylor Instrument Companies
Tennessee Corporation
Tex-Chem Co.
Turbo Machine Company

Union Carbide Chemicals Company 14

Verona Dyestuffs
Virginia Smelting Company 8

Wallace & Tiernan, Inc., Harchem Division
Wallerstein Company
Warwick Chemical Division
Watkins Salt Company
West Indies Chemical Works, Ltd., The
Wica Chemicals, Inc. 4
Wolf & Co., Jacques
Wyandotte Chemicals

Young Anline Works, Inc.

Zinsser Division
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Monoethylaniline

For further information on these and other dyes and intermediates write to: Wilson Organic Chemicals, Subsidiary of

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